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GLEANINGS IN BEE CULTURE

A JOURNAL DEVOTED TO BEES AND HONEY AND HOME INTERESTS

ILLUSTRATED SEMI-MONTHLY

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STRAY STRAWS FROM DR C. C. MILLER

THE SECRET, most likely, of the large membership of bee-keepers' societies in Germany lies in the fact that the bee-keeper gets back *directly* the worth of his money in the way of reduced price of bee-journals and in other ways. New York bee keepers seem to be following somewhat the same plan, and I'm wondering whether it may not be partly due to the fact that a man by the name of Greiner happened to select Germany as the land of his birth.

E. S LOVESY says, in *The Rocky Mountain Bee Journal*, that last year sweet clover yielded nothing except along the water-courses. That's the first report I've seen saying sweet clover failed to yield nectar anywhere. [This reminds me that *The Rocky Mountain Bee Journal* is a very creditable publication—nicely printed, and the general subject-matter is good. We wish our newly arrived cotemporary success; and we see no reason why Colorado alone could not give a fair support to a bee-journal.—ED.]

"THE MEANEST STOCK to introduce a queen to is one having cells almost ready to hatch," quoth ye editor, p. 184. Must have forgotten just then about laying workers. [Y-e-s—but, a colony with fertile workers is not, in a sense, queenless, is it? for it has one or more (drone-laying) queens, or what they think are queens. It is usually not possible to introduce another queen to a colony already having one or what they regard as one. When I made the statement in question I had in mind a colony that was queenless—entirely so.—ED]

DR. PAUCHET, *La Nature* says, replaces cod-liver oil with butyroniel, composed of two parts of fresh butter and one part of honey, beaten together. He says it is more readily accepted by children, a thing not hard to believe. [I remember my mother used to give me honey and butter when I had a cold. If there is any virtue in such a combination it might be a good idea for us parents to give our children bread and butter and honey, and lots of it. "Honey and butter shall he eat," the good Book says, and its advice is always good.—ED]

SWEET CLOVER, says H. M. Jameson, of California, in *The Ruralist*, "blooms here the first season, and continues for several seasons . . . The yellow variety abounds here, but the bees never touch it." Three things in that statement are at variance with previous reports. Does the same thing hold true in all parts of California? If its life history is so much hurried up that it blooms a year sooner than elsewhere, one would think it ought then to die as an annual instead of being prolonged as a perennial.

I AGREE heartily with Rambler, p. 185, in thinking a dead-level country is too monotonous. When I came from among the mountains to a prairie State I couldn't stand the level, so I got a spot right on a hill and built a home on it; and if you were to be set down here blindfolded you couldn't tell whether you were in Illinois or Pennsylvania. I'd want good pay to agree to spend the rest of my life on a level (although I'm trying my level best to live "on the level"), or anywhere where the dwellings were thicker than one to every ten acres.

SPRING being at hand, let me remind those whose bees work a little on red clover, and who are trying to grow red clover with short tubes, that, if they can get seed from the *first* crop, they will stand a better chance of success, for just at that time bumble-bees are too scarce to fertilize many blossoms, and so a larger *proportion* of seed in the first crop may be of the desired kind than in the second crop. Of course, there may be a larger quantity of short-tubed seed in the second crop, but it will be mixed with a still larger quantity of seed that you don't want.

"WHY IS IT that the bees would peel the cocoons from the sides of the cell and leave the septum?" says W. T. Stephenson, p. 141, evidently thinking that the same thickness of cocoons is on the walls as on the septum. I think I can show you a good many old combs with the septum ⅛ in. thick. Now, suppose the same amount of cocoons on the cell walls;

that would leave the cells measuring 13 to the inch instead of 5 to the inch, and it would take 6¾ of the bees to weigh as much as a common bee. Were your workers as small as that, friend Stephenson? [Yes, yes; you are correct. I had not thought of putting the matter in that light.—ED.]

A. I. ROOT is a convert to the plan of having hives "supported just high enough from the ground to make it easy to work without stooping," p. 197. In some parts of the South I think there are special reasons for having hives thus raised on account of ants, other enemies, or water. I infer friend Root prefers it on the score of comfort, and he has a very small following. More than 30 pictures of hives in actual use are given in A B C, and only one of the pictures shows the hives thus raised, and that's in South America. One who works much at bees will sooner or later come to prefer to work at them sitting, and the ground is the place for that If raised to work with ease standing, the ease is gone when three to five supers are added.

IT MAY BE that beet sugar is just as good as cane sugar, p. 193, but I confess to a little uneasiness so long as it is insisted across the water that beet sugar is bad for bees. They're not all fools over there; there are some bright men in England and Germany, but I don't remember to have seen one of them contradict the statement that beet sugar is inferior to cane. I only wish we could know just what the truth is. It's a thing no chemist can settle as a chemist, remember that. Can we look to the experiment stations for an answer? [No, indeed. Among the intelligent beekeepers across the water there are no fools. In scientific investigations they are usually ahead of us; but I am inclined to believe they have made out too bad a case for the beet sugar.—ED.]

YOU SEEM TO LEAN toward Ira Barber's view, Mr. Editor, p. 195, but you don't answer my question. If it stirs up the bees so much to have just a little fresh air leak into the cellar, how is it that it quiets them down to have the whole cellar flooded with it? [In the same way that giving swill to pigs stops their squealing. If the pigs get to expecting the swill they will squeal until they get it. Then they are satisfied. But that does not signify that they will not squeal at the next swilling-time. I do not know that this hits the case exactly, but it struck me that *perhaps*, after one infusion of air, the bees are satisfied; and then, discovering that roaring will bring on more fresh air, they will roar. Perhaps bees do not reason like pigs; but when robbing-time comes on we do know they will show greater sagacity.—ED.]

IT STRIKES ME that the Rambler-McCubbin plan of having all increase go to the owner of the bees is a bright one. Then there's no temptation on the part of the bee-keeper to overdo the matter of increase. [Rambler referred to this disposition of increase, in an article, about a year ago. It struck me as being so equitable that I incorporated the feature in a provisional contract in "Bees on Shares" in the new edition of our A B C book. The operator, if he understands his business, will, on this plan, bend every energy toward keeping down increase; because, if he is to make any thing, he will have to realize his profits from *honey* and not from bees. If he were to share equally in the increase and honey, the probabilities are that both operator and owner would not make as much in the end as on the other plan.—ED.]

SOME LETTERS lately sent to GLEANINGS show an irrepressible desire to be honest, and to sell a section for no more than its actual weight, and at the same time there goes with it the belief that a certain size of section can be found so that there will never be more than a range of an ounce between the heaviest and lightest weights. Friends, that's all a myth. The average weight of one year will differ from that of another; they will vary in the same year; and you'll find no reasonable size that will not give a variation of three or four ounces between the heaviest section of a heavy year and the lightest section of a light year. [Yes, you are right. Then why should we place so much stress on sections holding a pound? and why should we not rather sell by the piece, and thus avoid all the figuring and waste of time?—ED.]

MATING QUEENS in confinement, that dead, decayed thing that has been carried out and buried, comes up smiling in *Review* for a rehearing, and Hutchy seems to think there may be something in it. And—must I make the humiliating confession?—I'm a believer in it myself. Listen: If you had a cage a mile high, a mile long, and a mile wide, there would be no trouble about having queens mate in it. A smaller cage might do, the practical question being *how* small. Well, J. S. Davitte has found the answer to that question, and he says the cage must be 30 feet in diameter and 30 feet high. He had 100 queens mated thus in one year. The way he manages—but I'm sure the editor or Stenog will tell you all about it. [Your Straws came after I had prepared an editorial on this subject; and you will note that I, too, believe that there is something in it. But I am afraid A. I. R., when he comes home from Florida, will hold up his hands in horror; but if he thinks I have been carried away by a new old fad I shall have the satisfaction of knowing I am in good company.—ED.]

PROF. COMSTOCK, the able entomologist of Cornell University, sees no reason, from the structure of the mouth-parts of a honey-bee, why it should not be able to bite into a grape or peach. Prof. Cook says, in *American Bee Journal*, that he does not wonder at this statement, but that the practical question is not whether bees *can* bite grapes, but whether they *do*. And it has been proven over and over again, that, when a cluster of grapes is given to bees in a time of scarcity, some of the grapes punctured with a pin, the bees promptly clean out the punctured grapes but never bite into the sound ones. My view of the case may not be scientific, but I have a lingering suspicion that it is a physical im-

possibility for a bee to bite into a peach or grape. [I think your suspicion is well founded. I have examined the mouth-parts of several different insects, and it seems to me those of any one of them are better adapted for cutting or puncturing fruit than those of the bees. From what I know of bees they would cut and slash through the skins of fruit during a dearth of honey if they could. They have no more conscientious scruples about wading into the nice preserves of the housewife than the highway robber has for stealing my watch.—ED]

YOU SAY, Mr. Editor, that bees will start in an extracting-super when they wouldn't in sections, and when this is replaced by a section super they'll start promptly in the latter. I don't doubt it in the least. But that still leaves it an open question with me whether the plan is advisable. Now please answer two questions: How many days after the extracting-super is given before they will start work in the sections? Do you *know* that they would not start just as soon in bait sections if these are given in place of the extracting-super? [I have found that many of our pure Italian colonies were very stubborn about going into sections, even when I gave them "baits;" but by giving them a shallow super of extracting-combs all drawn out, I could induce most of them to start upward at once. When they have stored a little honey above, and become accustomed to going above, which would take anywhere from one to two days, I would take this extracting-super off, and give them, instead, sections with full sheets of foundation. The habit of going above seemed to be so strong that those same bees that had been stubborn before would now go right into the sections. I did not allow any such colonies so treated to store very much honey in extracting-combs As soon as the bees entered them and began to store a little honey I would take them off and give them to other stubborn colonies. Thus one set of extracting-combs might answer for four or five colonies, but usually not more than two.—ED.]

SO YOU THINK I rate a little too highly the value of Dzierzon's contributions to bee culture, Mr. Editor. Possibly, but that's my honest conviction. You have grown up under the full light of the Dzierzon theory, and is it not just possible that it is a little difficult for you to realize just what it would be to have that light totally extinguished? Perhaps, too, you may not give full force to the fact that Dzierzon gave the movable frame to a large part of the bee-keeping world. I do not think of any one living man who has done more for bee-keeping than those two things. [Dzierzon gave the movable frame? Why, doctor, it must be you have forgotten. If you are basing your authority on Cheshire, I am afraid you are misled. What Cheshire says concerning Dzierzon, and his connection with the movable frame, is contradicted by Charles Dadant and L. Stachelhausen. Samuel Wagner, than whom there is no better authority, says in the *American Bee Journal*, page 14, Vol. I., that "Dzierzon did not invent a movable frame; that he only improved a method for handling movable *combs*;" that Della Rocca, as you will see by reference to the authorities, devised a method for using movable *bars* to which combs were built; but in all these cases it was necessary to cut the combs away from the sides of the hive as well as from the bottom, before they could be taken out. Dzierzon improved on this by using bars in a top-opening hive. Later on, Berlepsch invented a movable frame, but not till after Langstroth had patented and brought out his invention. But for argument's sake, assuming that Berlepsch was prior, you will see that the Langstroth invention made a practicable movable frame, which the Berlepsch was not. Before we could give credit to Dzierzon for the invention of movable frames we should have to mention the names of Munn, of England; Debeauboys, of France; and Propokovitsch, of Russia. But if any one is to be credited for the invention of movable frames before Langstroth, that honor should be extended to Huber, who did make a closed-end frame that was a great improvement on any of the frames ever invented until the Langstroth came out. The Quinby, the Heddon, and the Danzenbaker are, practically, modifications of the original Huber. For my authorities I would refer you to the *American Bee Journal*, Vol. I., for 1861, page 14. There you will find a most interesting and valuable article by Wagner. While it is admitted by this writer that Dzierzon's improvement on the movable bar "received general acceptance and approval in Europe," yet he limits this invention to "bars," and not "frames," as you will see. Now turn to GLEANINGS for May 15, 1888, pages 379–381; then, if you care to, turn to Dadant's Langstroth Revised, from pages 137 to 144. But I would not detract from the glory that Dzierzon has won in his great discovery of parthenogenesis. That alone is enough to make him great in the mind of any intelligent bee-keeper. But as long as it is generally conceded now, both in Europe and America, that Langstroth was the first to bring out a *practicable* movable frame I think we ought to concede that honor to him.—ED.]

A strange commingling of the weather now—
Fogs, rain, zero, then more snow;
Then slush, then mud, then icy walk,
And all within a day or so.

L'APICULTURE PRATIQUE.

This is a new French bee-journal published in Mr. Dadant's native department (Haute-Marne) in France. The first number is before us. It presents a fine appearance, and gives an account of Mr. Dadant's visit to his old home. From it we also learn that the Minister of Agriculture of Hungary has just created a special school for the study of apiculture.

The course comprises theory and practice in an apiary having hives of all systems, an experimental field for testing honey-yielding plants, and a laboratory for different kinds of honey and wax.

Mr. Voirnot, "the most active, the most ardent, and the most intelligent propagator of movable-frame apiculture in France or Belgium," died recently at Ludie, France. Mr. V. was one of the most voluminous writers on apiculture that ever lived, and his productions were highly esteemed. His death will cause a large vacancy among bee-keepers.

BRITISH BEE-JOURNAL.

The discussion as to the size of sections has lately assumed interesting proportions in England. That a thinner and taller section seems to be demanded there is evident after reading several letters from prominent British bee-keepers. Mr. R. M. Lamb is one of the most active persons in the agitation of this question. In the issue for Feb. 7 he says:

In the previous article, after noticing how Mr. Cowan supported my view as to the natural thickness of honey-comb I ought also to have given the following quotation from The A. I. Root Company's catalog for 1900 (page 6):—"A tall section holding approximately a pound weight permits of the use of a thinner comb—a comb more nearly approaching combs in nature. Thin combs are said to be filled sooner and are far better filled, and it is also thought that honey ripens better in them." I can hardly think these statements would have been inserted if they had not the support of some successful bee-keepers. This catalog, I may say, came into my hands only at the beginning of this winter, and in it I have found several ways in which my experience has been strikingly similar to those of many of our brethren over the water.

In the next issue Mr. F. W. L. Sladen, a bee-keeper well known on both sides of the water, writes:

I have been following the discussion on the size of sections started in your pages by the Rev. R. M. Lamb, with much interest. I see that Mr. Lamb now advocates not only a *thinner comb* in the section, but also a *larger* and *taller* section than our present 4¼ inch by 4¼ inch section.

Having been for some time interested in the question of tall v. square sections, I last year gave the tall sections a trial, and selected for this purpose Root's "Ideal" plain sections, which measure 3⅝ in. by 5 in. by 1⅝ in. These sections have a thin comb, as recommended by Mr. Lamb, but when finished they weigh only about 13½ oz. Owing to the bad season I got only a few of these sections finished, but every one who saw them thought them much better looking than the ordinary 4¼-in. square sections.

Further down Mr. Sladen says:

I agree with Mr. Lamb in his further demand for a taller section.

For a better presentation of this matter, see page 246, written by the editor.

SOUTHLAND QUEEN.

Dr. Howard Gilmore asks:

I notice *Gleanings* is making lots of fuss about long-tongued bees. I don't know whether they will beat others here or not. We do not have any red clover for them to reach. Our cotton-blooms are large, and basswood is not very deep. What do you think about that strain, Bro. A.? Are they any better for us here in the sunny South than any other good Italian bees? If they are I should like to try them a fall, as I like to have the best.

The editor replies:

Our notion is that, if bees' tongues can be bred a thousandth of an inch longer than nature intended, they can be bred with tongues a foot long It is our opinion that there is a great big nonsense lurking around long-tongued bees. We do not think there are any better bees in the world than those we have in Texas, and they never saw red clover. . . We think some soils will grow red clover with shallower nectar-cells than others.

One is inclined to think that the "nonsense" that lurks around long-tongued bees is in the mind of those who do not consider the matter of locality. As for the length of bees' tongues, Nature never had any intention concerning them any more than she did when she made a pig with a snout a foot long, and yet enabled man to breed that snout down to a mere vestige of its original comeliness. But it does not follow that the tongue of a bee can be lengthened a foot simply because a half can be added to its average length, nor would that be desirable. The movement for longer tongues is simply to get the red-clover crop of the North, which now is practically all wasted. The bees, no one claims, would be any better except on that account. If anybody can get along with a 14-foot ladder to get on his 14 foot house, all right; but if others have houses 20 feet high they are entitled to a longer ladder. A bee with a tongue-reach of ⅓ inch would, we are morally certain, add greatly to the yield of honey in the Northern States, and that, too, of a quality so good that all other honeys would have to be compared with it for a standard, except that from other clovers.

BOTTLING HONEY.

Washing the Jars; Packing for Shipment, etc.

BY CHALON FOWLS.

In my former article on bottling I did not describe the process of washing the jars, so I will do so now.

We generally run them through water twice, using merely tepid water first and hotter water last, so as to avoid breaking the glass by too sudden changes. When there is sand sticking to the inside of the jars, our folks use a swab or rag tied on a stick when washing the first time. Some might like a woven-wire pot-cleaner to shake around inside and loosen the sand; but our folks will have none of it. After the jars are rinsed they are turned bottom up on two or more thicknesses of crash toweling for half an hour or more, when they are ready for use. The towels take up the water like a sponge, so that they get dry quicker; besides, there is no water streaming down on the floor.

Perhaps it might not be amiss to give my method of packing for shipment Shipping-cases can be bought with some kinds of jars; but the 1-lb. cans come cheaper by the barrel,

and, at the grocerirs, I can get boxes which I saw up and make over if too large. I prefer the latter plan, as I can make wages doing the work in winter. The boxes are made large to give room under the jars for two or more inches of packing, and something springy should be used—planer shavings, for instance, putting some pieces of shingles or pasteboard over the packing to set the jars on so they will not work down through so as to get to the bottom. In this way the honey-jars ride on a sort of springy cushion, and I have never had any complaints of broken jars when so packed. The tops of the boxes are stenciled "Glass, this side up," and the shipping-tags tacked on top; and the railroad men will keep them right side up, because they want the tags on top, where they can be seen. I pack not less than two dozen in a box, and put in four dozen when the orders call for that much. Each jar is wrapped well with paper before packing. I use old newspapers for the purpose.

In the picture my daughter is seen at my left, wrapping tumblers, while I come next, packing, and my boy Arba is nailing on covers at my right. It will be seen, by looking at the open box in the picture, that every other tumbler is placed bottom up. By packing in this way they keep in place, and no packing is needed between them. If more honey is put up than is ordered, it should be kept, preferably, in a warm room; but if it must be stored in a cold room it should either be packed ready for shipment or else covered up closely in boxes to prevent their getting too cold and then sweating when placed in a warm store, thus making the labels come off.

Since writing the foregoing, GLEANINGS for Feb. 1st has come to hand.

PREPARING HONEY FOR SHIPMENT.

On reading over the symposium in that issue, I see there is one point that should be explained more fully, in justice to the method advocated by Mr. Deadman and myself. If the honey is kept quite hot, say at 160°, during the process of filling the bottles or glasses, it will be found that the bubbles will all rise to the top in a very short time. Now, I contend that, as this takes place before it has time to cool, it makes no difference at all about its candying afterward. There will be an air-space at the top, just as in canned fruit, so the result is the same by either method.

I see the editor infers by my former articles that I am put to some trouble in exchanging jars at the grocer's on account of their getting candied. I will explain that, since we have improved our methods of putting up, the exchange business is done away with. I no longer need to exchange, although I still agree to. In fact, *only one jar* has been exchanged during the past year.

Oberlin, Ohio.

[In reference to the matter in your last two paragraphs concerning pouring honey hot and honey cold into glass jars, you are probably right in saying that the bubbles will rise to the top, where they will do no harm. So we shall have to conclude that the question whether we shall pour hot or cold honey into the jars is rather one of convenience than one of difference in results.—ED]

RETAILING EXTRACTED HONEY.

Bottled Goods v. Those Put up in 8-lb. Pails for $1.00; a Valuable Article.

BY THOS. SLACK.

I have been a good deal interested in the articles you have published from time to time on putting up and *marketing* extracted honey, etc. This is a very important point in any business, for it is of little use manufacturing or producing a nice article and then realizing only half price for it. R. C. Aikin comes nearer my idea of the right thing than any of the rest, but I differ with all of them in one or two points, although it may seem rather cheeky for me to say so, as many of your correspondents sell tons where I sell hundreds; but I doubt very much if they could sell any more than I can on the ground I cover with my market-wagon, some 21 miles in three directions each week in the summer. My sales have *always* been limited by the amount of honey I could produce or buy at a low enough price to pay handling. Candied honey can be sold to a limited amount here; but liquid honey sells as ten to one against candied. Most of my customers are farmers, mechanics, or laborers (no stores), or people who have to earn their own living, and a fancy price can not be looked for — about 12½ cents a pound. One year I sold at 10 cents.

Bottling hot or bottling cold will never trouble me, as I have no use for either. I give my ideas from my standpoint here for this section, and I do not think it differs much from any good farming section with good villages or small towns scattered around it. I never touch comb honey to sell. Loss from breaking down just wipes the profits clean out. I never sell a *single* pound of extracted honey. My unit in selling is $1.00. If a customer asks, "How much is your honey this fall?" I say, "Eight pounds for $1.00, pail included." Perhaps, if a stranger to me, they will say, "I want only one or two pounds." I explain to them I can not very well carry conveniences for weighing on my wagon, and I have it all weighed up in pails nicely labeled, a card explaining that the honey will likely candy in cold weather, but that it can be brought to a liquid state again without hurting the flavor, and telling how to do so. Pasted on the pail it prevents the trouble Mr. Aikin speaks of, of losing a customer because his liquid honey candied. If possible, have them taste the honey, and do not have any that is not fit or a pleasure to taste. If the customer wants honey I very seldom miss selling him a pail. I used to put the honey up 8 lbs. net, the pails to be returned when empty; but this did not work well. After losing about 125 pails one summer I set my thinker to work, and struck the following plan: Weigh up 8 lbs. gross for $1.00, the pail a legal tender for 10 cts. if returned in good order. This works perfectly — no friction, no loss. I do not believe in putting up honey in glass or selling by the pound, for the following reasons: Too costly and too much bother for one thing; but more particularly because, if a person buys a bottle or a tumbler of honey, the price is pretty high including the glass. Now, very few families (about one in twenty, not to be wild, probably nearer one in one hundred) eat honey. I do not mean to say they do not taste it, but they do not look upon it as food, something to nourish the body with. If they buy a nice white section of honey, that sacred thing is put aside against company coming. If a tumbler, it is put aside as a nice thing in case of colds, etc. The children must not touch it. Come and try to sell them some honey. "Thank you, not any to-day; we have some on hand," and you do not sell them any until some one of the family has a cold or company does come. With a pail in hand there is a feeling of plenty. As I heard a man say once, "I do not suppose I can or do drink more milk out of a pan in the milk-room than I can out of a tumbler in the house, but all the same I like to drink out of the pan. There is a sense of freedom about it that suits." The children want some honey with their biscuits; there is plenty, and they have it. It is put on day after day, until, halloo! the bottom of the pail is reached! They have acquired a taste for honey (the older people as well), and got into the habit of eating it, and another pail must be bought, adding much to their comfort and good health, and profit to the seller. I believe, and feel quite sure, that I can sell more good extracted honey at 8 lbs. for $1.00 than I can for 10 cts. a pound. As A. I. R. once said, "If there is one thing I excel in it is being able to employ a lot of help and make them earn their wages."

Now, if there is one thing I am good at it is being able to sell any *good* article I have at a *good* price, and hold my customers; and one thing I have found out is, don't bother your customers much in making change. Take whole coin, not cents. It is easier to get $1.00 for honey from one man than 50 cts. from two. I can sell a good many more cucumbers or cabbage at 3 for 25 cts. than I can at 8 cts. each. I do not mean to say that any stranger can go in and sell on these lines anywhere; but a *good* man with *good* goods, if he is a *good* salesman, can do it. You must have the confidence of your customers. It takes fair and square dealing, and time to get that, and when you have it, *keep it*, as you will find it profitable, both for your pocket and your soul —for your pocket, for it enables you to sell; for your soul, for, to keep their confidence, you must have clean hands and a straight tongue, and so a good conscience.

Waterloo, P. Q., Dec. 26.

[There is a great deal of sound truth in what you say, friend Slack; and, by the way, you are not so *slack* a man as your name would seem to indicate, for apparently you have given attention to even the small details.

But a policy that would be advisable for your locality might not be a good one to follow in another. If you were to move to Oberlin, Ohio, you would find a very large class of customers who would buy in small "dribs," but who would not take any honey if it were put up in pails requiring the expenditure of a *whole dollar*. Some of the poor people of that town, I fancy, would look at the dollar, and then look at the pail of honey; and if they could not buy a dime's worth of your goods put up in glass they would go away with the shining dollar and leave you in possession of the honey.—ED.]

THIN FOUNDATION FOR BROOD-FRAMES.

A Scheme of Wiring; the Economy of Using Thin Foundation in Place of the Ordinary Heavier Standard Grades in the Brood-nest; Square v. Tall Sections; Greasy Sections.

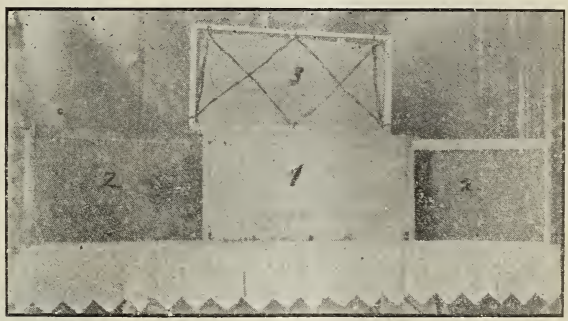
BY WM. M. WHITNEY.

Mr. Root:—Last year I commenced experimenting with extra-thin surplus foundation for brood comb, and promised to give an account of results as soon as my experiments warranted doing so, which promise, I believe, may now be redeemed.

I hand you a photo of sample of brood comb made from such foundation, using 13 sheets to the pound, Langstroth size. Truer, better-built comb I've never seen. No. 1 is a frame of solid honey from top to bottom, taken from the brood-chamber. No. 2 are frames of comb from which the honey has been extracted, and have been used for brood. No. 3 is simply a frame of foundation showing the line of wire. The frames are the staple-spaced, groove and wedge, thick top-bar. The only difficulty experienced was in two or three instances where the wedges were too thin to fasten the foundation securely, which, by inadvertence, were overlooked.

You will find on the next page a diagram marked No. 4, showing the method of wiring. The hooks are made of slim nails, or brads, of the proper length, driven from the outside, excepting in the top-bar, where they are driven from the under side at the outer edge of the foundation-groove. After the nailing is done, the hooks are made with a pair of small round pliers. The wire is run from the spool, placed upon a spindle to hold it stationary, commencing at No. 1. and following the course of the arrows as shown in the drawing, the whole work being done more rapidly than I've been able to do it in any other way.

The method of wiring is not new with me, but was obtained from my very dear friend Henry Bosworth, of Newbury, Geauga Co., O., who always produced most perfect comb, and did all his work about his apiary in the neatest and most approved manner. In his death, which occurred several months ago, the fraternity lost one of the most practical bee-keepers



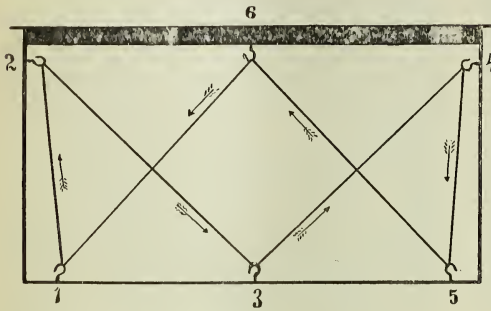
I have ever known. I always felt doubly paid whenever it was my good fortune to visit his place and observe his work.

Other methods of wiring may be as good, perhaps, but this suits me. After the wiring is done, the manner of putting in the foundation is as follows:

Set the frame top down, with foundation-groove next to you. Hook the wire from the center of the top-bar, aided by a slight pressure upon the bottom-bar to loosen the wire. Slip the foundation into the groove, and hook the wire, at the same time turning the hook so that the side and wire shall press against the foundation, thus making a smooth surface. Turn the frame around and press the wedge in place, and the work is done.

You will notice that by this operation there is a pair of diagonal or bracing wires on either side of the foundation. Now, if these wires are drawn taut, and the foundation securely wedged, there will be little or no need of imbedding the wire, as the bees will build over it all right. The spur-wheel often pricks too deep, and leaves a ragged line along the wire, which is a cause of the tearing-down of foun-

dation. I do not mean to say that bees will not, under other conditions, tear down foundation, for they sometimes do ; but this is a fruitful source of this mischief, of which we hear complaint.



Wiring thus, holds the foundation in place until the bees shall have fastened it ; and if there is any expansion, there is no danger of buckling ; hence even, straight comb is the result.

Care should be taken in placing the frames in the hive. It would not be advisable to put such foundation in the center of a hive of a populous colony during very hot weather, as there might be danger of its breaking down before it had become securely fastened ; but it would be all right at the sides and in the second story, or in building up a weak colony anywhere. I have had no trouble in hiving new swarms on such foundation.

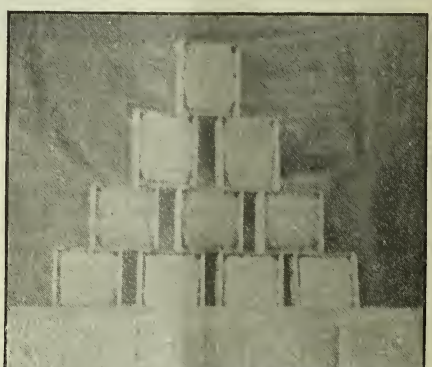
Now, it will be readily seen that, if 13 sheets to the pound can be successfully used, it will be very much to the advantage of bee-keepers to use such instead of 6 to 8 sheets, as has been the custom, notwithstanding the price is slightly higher. When bee-keepers come to understand that 2 lbs of foundation is sufficient to fill 3 hives, instead of 3 lbs. being required to fill 2, much more foundation in full sheets, and fewer starters, will be used, and less drone comb produced ; thus everybody connected with the business will be benefited.

I've also been experimenting along the line of comb-honey production, which has given me much satisfaction. The standard 4¼ and 4x5x1¾ beeway sections, with and without separators, were used. As this has not been a favorable season for honey in this locality—surplus coming late and very slowly — better results have been obtained without than with separators, excepting where they were perforated with $\frac{5}{16}$ holes. With solid wood separators, bees built brace-comb, more or less, in nearly all the hives, thus injuring cappings ; but with perforations, say five to each side of the section, the comb was built as true as if a straight-edge had been used. A photo of samples of such are herewith inclosed. Neither photos of brood comb nor sections show as well as the originals. Sections in lower row are capped as white as snowflakes ; but next above are what are known as *greasy cappings*, all from the same case.

In my experiments with the surplus chamber, two of the most populous colonies were selected to test the matter of greasy sections. Cases containing 32 sections each were placed over the brood-chamber with the winter cushions kept on all summer, an air-space of about three inches being left around the section-case, as the hives are what is known as the two-story chaff, with packing inclosing the first story only, leaving the second story simply an outside shell of thin material.

The season, as before remarked, has been a slow one, and the center of the case, as a matter of course, being first occupied, was completed before much if any attention was given to the outside rows of sections. After the fall honey-flow began, much quick work was done. Through the center of the cases every section, excepting at the extreme ends, was capped *greasy*, not travel-stained, but *thoroughly greasy* in appearance ; but the outside sections were capped as white as one could wish to see. The inside sections were much heavier, the honey being very thick and waxy, and very fine.

One thing further, and I'll not tax your patience longer. With such a season as we have had this year, the 4¼ section is filled and capped more completely than the 4x5x1¾, as shown in the photo, all of which were used with perforated separators. With a flush flow there would be, probably, little if any difference. This is my first experience with 4x5 sections. I have some handsome specimens, and like them very much, barely balancing the scales at a pound each. I think such as I have with beeway space, with perforated separators, preferable to the plain with fence. On submitting them for inspection by the side of standard 4¼ to several ladies, at different



times, the unanimous verdict was in favor of the square section ; "and they look so much nicer when placed on the table."

While we obtain theories and hints from the books and journals, which are absolutely necessary to success, we acquire more positive knowledge by careful work in the apiary than anywhere else. It is to be hoped that careful bee-keepers will do a little experimenting

along economic lines, not with a view to cheapening the quality of products, as is too often the case in many lines of manufacture, but to learn how to obtain best results with the smallest outlay of capital, remembering, however, that, as a rule, the best material is economical if intelligently applied.

Kankakee, Ill., Nov. 23.

[I have long entertained the idea that the time would come when we could use the same foundation that is ordinarily used in sections, in brood-frames. The only difficulty, hitherto, has been that such a light weight has a tendency to stretch during the time of drawing out, causing drone in place of worker-cells. The solution of this difficulty is in the use of some sort of wiring or stays by which the foundation may be kept from stretching. The A. I. Root Co. has been working on this problem, and is still considering it, and it hopes in the future to be able to turn out an extra-thin foundation, having incorporated in the wax, either before or after milling, a very fine grade of wire in the foundation, the wires being placed about two inches apart, and in such a manner as to hang perpendicularly when the foundation is suspended in the brood-frame. It will take time and patience to work out the problem; but when it is, bee-keepers will be able, for the same money, to use 3 lbs. of foundation in place of two as now; and I am not sure but they can do so now if they follow out carefully the plan suggested by Mr. Whitney above. But it will be very necessary to follow him very carefully, otherwise there will be a great many drone-cells in the finished combs.

The scheme of wiring is very similar to the one we advocated and used, known as the Keeney plan, but which we finally abandoned because the foundation had a tendency to bulge in the diamonds made by the intersecting wires. We concluded at the time, it was better to use either parallel horizontal or parallel perpendicular wires.

The only plan by which such method of diagonal wiring may be made practical on so light a grade of wax, is to let the foundation hang free from the wires, *without imbedding;* and even then it must be put outside of the center of the brood-nest. If friend Whitney were to have these diagonal wires imbedded into the light-weight foundation he speaks of he would have trouble in the way of bulging at every diamond or intersection of the wires. If the frames hang true, the bees will do their own imbedding as the comb is drawn out into shape, and the result would be beautiful flat slabs of comb.

Referring to tall v. square sections, I am of the opinion that, if those beeway sections had had four openings, Mr. Whitney would have found the result in favor of the tall box. Or if he had used plain sections, both square and tall, with fences, the difference would still have been in favor of the tall box; but under the conditions named, I should suppose that the square one would be filled just as well at least.

There is no denying the fact that a square comb, when cut out, looks better on the plate than the tall one; but when the honey reaches that stage in its history, it has been sold. It is not how the honey looks on the *plate*, but how it looks on the market *before* it is sold.

In conclusion I desire to say that this article, in my opinion, especially that part relating to the use of foundation, is very valuable, and it is high time that bee-keepers were considering whether they could not save many dollars by using the lighter-weight wax in the brood-nest.—ED.]

CONTRACTION, AND BELGIAN HARES.

BY W. A. H. GILSTRAP.

In GLEANINGS, page 874, last year, you say in a footnote to Mr. Norton's article concerning contraction, "Now, it would be folly, it seems to me, to drop the discussion at this point, and I should be glad to hear from a number of our readers who have been working along these lines."

At the time, it seemed to me there were some good points coming out about contraction. But you have crowded out information on that point with some things that may be of more value, or the subject of contraction does not attract the attention that I think it should. Most writers seem to think contraction of the brood-nest should be practiced only with a short honey-flow when managed for sections. I have had no experience with such conditions, but have derived considerable benefit from contraction nevertheless.

To understand the subject well we should make a careful study of our range and honey-flow, not only as regards honey stored, but in connection with swarming and building up for another season.

The San Joaquin Valley, which is in the central part of the State, is about 250 miles long by perhaps 50 miles or more in width. Much of it is worthless for bees. Where we get honey it usually runs as follows: Honey enough to promote swarming from about the middle of April till the middle of May; then a honey-dearth for a month, after which the honey-flow may commence in earnest, but oftener it is light at first and increases until August, and usually quits about the last of September. Of course, there are exceptions as to localities and seasons.

My plan with the Heddon hive is this: Leave plenty of stores in the fall. In the spring, place a case of empty combs, except one comb which should contain brood, on the lower story. By repeating this as often as necessary, until early in August, it is possible to keep swarming down, and have stronger colonies, than by any other method I have ever tried.

During the last week in August a wood-and-zinc queen-excluder is placed on the lower story, and a case of combs containing no brood, or only foundation, is put on the excluder. The bees are shaken on the ground in front of the hive from the cases that contain the brood, and may contain the queen, while the rest of the combs can be sufficiently cleared by smoking to take to the

extracting-house. A week later I extract from the hive again, or at least look for queen-cells, but do not find them started in many hives. It will be remembered that the two lower stories need not be examined, which is quite an item with such strong colonies. If ten-frame L. hives are receiving much honey at the time, it would astonish the natives to see how the honey "just grows" in those Heddon hives.

I never tried inverting brood to get queen-cells torn down, and do not believe it would work. Once while destroying cells I noticed one, quite small, which had no more downward tendency than a drone-cell. I thought it was a queen-cell, and gave it a pinch to see, which revealed a lank young queen of surprising length for so small a cell. For experiment she was given to a nucleus, and proved to be an average queen for laying. Inversion would not have cost her any thing, and such cases are frequent. Early in the summer it might be different.

Of course, these contracted colonies winter in our climate with less stores than others do, and have ample time to build up for the honey crop. If properly cared for, not one per cent of them should swarm.

If you come around next September I shall try to convince you that the Draper (Dadant) barn is not big enough for a brood-chamber, and not the right shape.

Last fall I did not contract any. Egg-laying was reduced by requeening, and it seemed better to leave the rest strong for queen-rearing operations in the spring.

Now, if I can run the bees out of an L. hive into a box or "any old thing" I shall owe thanks to Mr. Lathrop and several others, if it gives the advantages of contraction. The objections which Mr. Massie raises to inversion in Tophet (p. 608, last August) do not apply to this locality.

BELGIAN HARES.

Lately I have been feeling very guilty about what I said on page 607 about Belgian hares. The "limited experience" referred to was for a few weeks last winter. Last summer I purchased a lot on the strength of that experience, and the almost universal fake claims of breeders—men I could safely believe (?). As an example, they are claimed to dress five pounds at five months old. As they are so big it is natural to believe such whopping statements. In fact, however, they weigh about half that amount.

The notice they get in Dec. 15th GLEANINGS, p. 977, is truly amusing. If the Secretary of Agriculture would pay express charges on a fine pair of hares it would be a pleasure for me to send him a pair for experiment. He would be apt to find so much difficulty in raising them that his fears would vanish about their increase when unprotected by man.

If I can make honorable exchange for something I can use I'll quit the business; if not, you can depend on my eating out. They should be good pets, but will never supplant poodle-dog worship. As food they can not be produced cheap enough. I can't learn where their tough hides sell for any thing. The stories of water-mouth, death from heat, neglect, and eating of young by the does; broken legs, lop ears, bowel complaints, and what not that breeders talk to each other about would surprise an outsider. To make these facts public might cause some folks to cry, "Great is Diana of the Ephesians!" for the space of half an hour, for their income would be jeopardized.

When I think of Belgian hares my next thought is, *fake!* and this is a valley with a record of 17 pups at a litter, and one cow produced four calves which grew off finely. The locality is all right.

Grayson, Cal., Jan. 1.

[If I understand, your method of contraction is not contraction as it is ordinarily understood. First, you practice expansion, running the bees up to their greatest possible strength. Then you contract, not by cutting down the size of the brood-chamber, but by restricting the egg-laying of the queen, and giving the bees, in lieu of cases of brood and honey, those containing either empty combs or frames of foundation.

Belgian hares are getting the black eye all along the line; and while they are now being condemned right and left I can not help feeling that the trend of discussion and opinion is going just as much to one extreme as it did in the other extreme in extolling their merits to the skies. I have been at the homes of bee-keepers where Belgian hares were reared for table use, and they had been so reared for a number of years.

In time this industry, like all others, will seek its legitimate level; but in the mean time I think we must conclude that, as a rule, where the growing of Belgian hares would pay, the rearing of poultry would yield a larger revenue, because from them we get not only the meat but the eggs.—ED.]

FORMING NUCLEI.

Helpful Hints from a Practical Man.

BY C. F. BENDER.

Although a professional bee-keeper and an interested reader of GLEANINGS I have never yet contributed any thing; but in looking over the volume for this year I see several places where I should have liked to put in a word if I could have done so at the proper time. As I seldom have time for much writing, I will, with your permission, write on several subjects in one article.

1. When I made my nuclei this summer, in spite of the fact that I left them shut up two days I saw so many bees going back to the old stands that I began to fear I should lose all my nuclei. Just for an experimeut I moved one of the old hives about four feet back, and was more than pleased with the result. The bees that had no other home would, of course, enter the nearest hive, which was their own; while those returning from the nuclei would make a few circles and return to their new home when they found the old one no longer there. Just

try this next time you are troubled by the bees returning, and you will *see* them do just as I have said. This method has saved me $20, this summer alone.

2. In extracting, instead of elevating the extractor on a box I have a box sunk in the floor of my honey-house (open side up, of course), large enough to hold two 60-lb. cans or a three-gallon pail, and covered with a tight trap-door sunk flush with the floor. When ready to extract I remove the trap-door, place the honey-gate of the extractor over the box, and set the cans under it. This is very handy where one has an extractor with a large space under the reel (mine holds 200 pounds), because the extractor is just high enough to be handy when standing on the floor.

3. In preparing outdoor colonies for winter, where the hives are on or near the ground I proceed as follows: Rip out sticks from ⅞ lumber, 20 inches long and one inch wide. Take 7 pieces of lath, each 2 feet long; place one of the sticks at each end, and nail the lath to them, spacing the lath equally, and leave the sticks projecting one inch above and below. This makes a hurdle, or frame, 2 feet long and 20 inches wide. To protect the hives, take three of these lath hurdles and place them on edge to form three sides of a square. Tie the sticks together at the corners, and fasten across the front of the hive (which is to be left unprotected), by running strong twine across at top and bottom. Fill the space around and under the hive with leaves or straw pressed in tightly, and also cover the top of the hive eight inches deep; or, better, put on a superful of coarse sawdust, using burlap over the frames. These lath protectors may be taken apart and stacked up during the summer, or used for chicken-coops by putting in another side and a cover. With hives facing the South, and thus protected, I seldom or never lose a good colony. This may be an old method, for it is a very simple and good one; but I have never seen it described.

4. Speaking of feeders, by far the best one for me is made of a box about 7×9 inches inside, and 3 inches deep, with a single piece of board, cleated, for a cover. An entrance is cut in one end and placed tightly against the front of the hive, so no bees can enter except from the hive. A wooden butter-dish is placed in this box, and filled with feed. Of course, this feeder can be used only in warm weather.

These little boxes can be very cheaply made from scraps, if one has a foot-power saw, and they are the most convenient feeder I ever used. The division-board feeder is excellent, but costs at least three times as much to make.

5. The editor recommends hand-hole sawdust for smoker fuel. I used it for some time, and liked it very well until I discovered by accident that the smoke from it is almost as pungent as cayenne pepper. Just make a hot fire with it, and take a sniff at the nozzle of the smoker. If you are a humane man you will never use it again. This may seem like a small matter to some, but I think it is wrong to cause unnecessary pain, even to the lower animals, and most especially to the bees.

Newman, Ill.

THE ORIGIN OF WIDE AND THICK TOP-BARS.

Width Essential, but Thickness Unnecessary and Wasteful.

S. T. PETTIT.

In GLEANINGS, page 798, Dr. Miller gives the width of his top-bars, and I am glad of it. He and you have said so much about deep top-bars that I had come to think you reckon on the deep feature as the chief factor in preventing burr and brace combs, while in reality it cuts no figure at all in that line. It is the width of the top-bar, or, rather, the ¼-inch space that does the work—governs the whole matter, practically so.

Mr. Root, I know you want facts, even if they do seem to cut deep; then don't be startled at this statement, for I am telling you an important fact that will stand the severest tests.

Years ago I wrote this matter up, but it was passed over as a thing of naught, while deep top-bars have been unduly lauded, and beekeepers have suffered. In order to secure the necessary rigidity I make mine ⅝ inch thick; but I'd much rather have them only ⅛ thick, if it were possible to have them of that thickness, or, rather, of that thinness, having the necessary rigidity.

I hope you will allow me to disabuse the minds of your readers upon this important matter, and possibly some one may invent the top-bar above indicated. Indeed, thin top-bars, whether the space is right or wrong, will have less burr and brace comb than thick ones; and then there are also other advantages. Let us notice the gain in space.

The difference between ⅝ and ⅞ is ¼ inch, which in the different kinds of hives now in use amounts to from 1600 to 2000 or more cells to each hive. The saving of that space in each hive is a matter worthy our best consideration. Another gain, the bees more readily enter the sections and stick more closely on cool nights. When I think of the thousands of deep top-bars you turn out annually, and the consequent loss to your patrons, I can not help feeling troubled about it. You are welcome to the honor of evolving the deep feature, but you will hardly claim the wide feature. I have written the above in a dogmatic, querulous style, in order to catch your attention and hope to succeed.

And now, Bro. Root, let us step into the 20th century with a top-bar possessing the nearest approach to perfection ever used; that is, one wide enough to form a ¼-inch space between them, and as thin as possible, having the necessary rigidity. Such is the top-bar of the 20th century, whether you lead the way or not. The deep feature must go. I wish to say a word about bottom-bars, if you will.

They should be ¾ inch wide, and about ¼ thick. A wider one, when being lifted out and replaced, is hard on the bees, and may injure the queen; and, besides that, the bees are more likely to sting; and, more: Wide bottom-bars are more likely to catch and choke the hive with dead bees in winter; but if they are narrower, the bees are more likely to build

comb under them when using deep entrances. The end-bars are of the same width as the top-bars. Of course, the width of both depends upon the spacing of the frames. Mine are 1⅜ in. from center to center. About 25 years ago I made measurements in all the old hives I could find in my neighborhood, and I found that that spacing was chosen and adopted by the bees when nature was working according to her own sweet will, and I believe they made no mistake in that.

Aylmer West, Ont., Can., Jan. 5.

[While, perhaps, I started the ball a rolling for wide and deep top-bars in this country, yet we of the Root Co. do not claim any thing of originality for them. When I attended one of the conventions in Canada, some ten or twelve years ago, I had quite a little talk with Mr. J. B. Hall, who incidentally happened to mention that, with wide and deep top-bars, he had no trouble from burr-combs. Dr. Miller was greatly struck with the idea; and after some extended correspondence with the doctor we decided that we would launch forth for the ensuing season the new top bars.

While width is certainly essential, and it is also necessary to have a spacing about ¼ inch between the top-bars, thickness does of itself play a somewhat important part—at least according to my experience and observation. I not only judge by what I have seen in our own apiaries here at the Home of the Honey-bees, but from what I have seen at other yards in several different States. We first tried top-bars that were wide, and only ¼ inch thick. We had trouble from such bars sagging, and the building of burr and brace combs. We next tried the wide bars, ⅞ inch thick and 1⅛ wide. Burr-combs disappeared almost entirely; and even when these frames might be called old they were still practically free from the nuisance. As a few of our customers objected to "sawlogs" for top-bars, we, a year or so afterward, reduced the thickness of the bars to ⅝, keeping the width the same. We soon discovered that brace-combs were more plentiful by the use of such bars than when they were full ⅞ deep. Then there came the objection to having a bar so shallow. We finally went back to the full ⅞-inch deep and 1 1/16 wide top-bar, with wedge for securing the foundation; and this has given the best satisfaction of any thing we ever tried.

When we first launched these on the market, we were met by the statement that the bees would not fill the supers so well over them. But here, again, careful observation convinced us that they did not offer any real hindrance to the bees. It was Doolittle who, when these new bars were put forth, condemned them, saying that the bees needed the burr and brace combs as "ladders" to get up into the supers; that thick top-bars would be the means of cutting down the surplus. But in later years I see he advocates thick and wide top-bars as the thing. As it is no disgrace for one to change his opinion on evidence, Mr. Doolittle, when he saw his error, was frank enough to admit it.

I think you are exactly correct in what you say about the width of the top-bar. If it is too narrow, the bees will build the combs past the bar; and if too wide they will build the comb within ¼ inch of it, and leave a nice hiding-place for queens, besides rendering the comb less stable because of there being no bottom attachments. Three-fourths of an inch is a very nice golden mean, and accomplishes the results most perfectly. The last few years we have been using them that width, and feel that we have no reason to change.—ED.]

GLIMPSES OF CUBA AND CUBAN BEE-KEEPING.

BY A. L. BOYDEN.

When I wrote my previous article, which appeared in the Feb. 15th GLEANINGS, I intended to follow it with this article March 1st, but was too busy to get my copy ready in time.

After visiting Matanzas I next crossed by rail to Cardenas. This was my first experience with Cuban railways. Here I found three classes of tickets are sold—first, second, and third; and, instead of a car devoted entirely to the mails, as we find in the United States, the mails were carried in a small compartment in the second-class cars. As I went into the depot at Matanzas I noticed a great many people were carrying chickens, having them tied by the legs, and a great many boarded the train with these. I bought a railroad guide at the window, and in this I found a paragraph in the rules to the effect that no first-class passenger should carry more than one rooster. This was quite amusing to me.

INDEPENDENCIA ST., CARDENAS, CUBA.

I reached Cardenas after little delay, and the only Americans I found on my trip were some showmen who were going to exhibit in Cardenas the following day. On my arrival I was met at the depot by Mr. Hamel and Mr. L. S. Houston, and was soon shown to the hotel La Isla de Cuba. I found very good accommodations there, but unlike any thing I had ever seen before. On my arrival at this place at one o'clock I was asked if I had had break-

fast. This seemed strange to me, but I found that their breakfast was from ten to twelve.

In the afternoon I walked up Independencia St., the leading street in the place, as shown below. Except for the height of the buildings, this street is not so very much unlike some of our American streets. It is quite wide, and the sidewalks are much wider than many in Matanzas.

When I went down to dinner that night I noticed that there were some mosquitoes about. I sat down to the dinner-table alone, and very soon the mosquitoes discovered that there was but little hair on the top of my head. I had got along in Cuba very well so far, but I was simply obliged to cut my dinner short and beat a retreat. The mosquitoes would give me no rest whatever. I consider this the worst difficulty I found in Cuba. Later on in the evening I went to my room, and, as the beds are provided with mosquito-bars, I passed a very comfortable night.

Early next morning I called at the office of Mr. J. B. Hamel. He had just returned from a trip in the interior. This gentleman, I am told, has been in Cuba some 25 years or more. He is interested in various enterprises, among which is the production and sale of honey, and later he has taken up the sale of bee-keepers' supplies as well. In the afternoon we drove out to his apiary, about three miles from the city, where I found several hundred colonies in frame hives. The harvest was just coming on, and it gave me a great deal of enthusiasm to open the hives and see the combs so well filled. We returned to the city late in the afternoon, and I went to the hotel for dinner. I determined that this time I should not be beaten by the mosquitoes, so I went down to the dining-room with my hat on, and kept it on during the entire evening. I don't want the readers to get the impression that these mosquitoes were more ferocious than ordinary, but I should say that they were very fond of Americans, and perhaps I am more sensitive than the average American in this matter. I do not mind a dozen or fifteen bee-stings very much, but I prefer to be excused when it comes to mosquitoes.

This being the evening of Dec. 24th, it appeared very early that the people were preparing for their Christmas festivities. I was told that the custom prevails there of having their Christmas dinner or feast on the evening or night of the 24th, and, as nearly as I can judge, many of the people do not go to bed at all that night—at least I remember a very troubled sleep, for it seemed to me that I never heard more noise all night long than I heard there. Very late in the night I got up, and, looking out, saw a band of people marching by to some kind of music, and not long after I saw another of the same. It appears that opposing companies are made up for some purpose—just what, I could not discover, although it occurred to me each was trying to outdo the other in the amount of noise it made. Instead of turkeys for their feast, as we have here in the North, roast pig is the principal article. I am told that every family who can afford it has the roast pig. I did not discover that the giving of presents was as common there as it is here, although this practice prevails to some extent.

Dec. 25th I left Cardenas for Havana, and reached that place late on Christmas evening. After some delay I found my way to the hotel La Isla de Cuba, fronting the Central Park, and during my stay here, of some ten days, I found this a most pleasant location.

Early on the morning of the 26th I engaged an interpreter, and together we started out to find my bee-keeping friends.

Readers of GLEANINGS will remember very well some articles in years past, from the pen of Fred Craycraft, formerly of Indiana, and later from Florida, and still later from Cuba. If I remember rightly, his first article appeared as long ago as 1882, in JUVENILE GLEANINGS. Mr. Craycraft is now chief clerk of the Record Department of the Cuban customs service. Before the war he had a large apiary, which was entirely destroyed at that time, and, while he has not lost his love for bee-keeping, he has recently taken the above-named position, as it is more remunerative.

I soon found my way to the custom-house, and within a few minutes after finding him it seemed quite impossible to realize that I had not known him before. He seemed exactly like an old acquaintance. This, I presume, comes about because I had known him by correspondence as well as his writings, and, in fact, it does not take two bee-keepers very long to get acquainted, anyway. Later in the day I met Mr. F. H. de Beche, who was also a bee-keeper before the war, now engaged in one of the leading houses in Havana, and a partner with Mr. Craycraft in an apiary recently established a few miles out of the city. These men found a little leisure time outside of their regular duties, and last fall decided to start an apiary. They ordered about 25 nuclei with queens from Florida as a starter. Being very successful with this lot they ordered another, and still another; and when I visited the apiary they had some 200 or 300 colonies.

In the afternoon of this day I visited the office and warehouse of Bridat, Mont, Ros & Co., large exporters of tobacco and honey.

Of my visit there and to the apiaries of W. W. Somerford and Harry Howe, both of whom the readers of GLEANINGS remember, I will write in my next.

HOW DEEP SHALL THE UNCAPPING-KNIFE SHAVE?

Coggshall's Statement Criticised; Unwholesomeness of Commercial Glucose.

BY E. H. SCHAEFFLE.

Extracting time will soon be here; in fact, the hills are covered with wild flowers at this writing, Feb. 23, in the lower part of the State. Here the bees have been shut in for a month past, during a continuous rain that shows no sign of abating. About once a week the bees get a chance to rush out and go to the alders, and come home laden with pollen. We are

hoping that this old-time rain will give us an abundance of bloom, and that the weather will be favorable while it is in bloom, which it has not been for years past. But, to go back to extracting.

We are all interested in securing the largest results from our bees, and for this reason I want to "agree to disagree" with Mr. Coggshall when he states that "In extracting, the knife should cut deep, so as to give the bees an opportunity to use up their surplus wax, which would otherwise go to waste." This is the first time I have ever known the bee to be charged with wastefulness, and I wish, in its defense, to state that the bee does not carry its surplus wax about in its pockets, ready to shake it loose like a chicken shedding feathers, when it has no further use for it. On the contrary, all raisers of comb honey know how difficult it is to get the bee to make comb, save when the honey is coming in with a rush. At that time a large number of bees are kept in the hive clustering in idleness, consuming large amounts of honey that they may "sweat wax," and this right in the heart of the flow. Now, I contend that every pound of wax made at this time costs many more pounds of honey; and the less wax the bees have to build, the more honey will be gathered. How about it, brother bee-keepers?

The manufacturers, bottlers, and retailers of glucose assure us that glucose is healthful, and to be preferred to sugar. The following, from *The Medical Record* of Dec. 15, proves the contrary:

> The English victims of poisoning in beer now number more than sixty dead and more than one thousand ill. It has been completely established that the cause of the poisoning is arsenic in the sulphuric acid used in the manufacture of glucose which the English brewers use in the place of malt and hops in the manufacture of cheap beer. An analysis shows that some beers contain arsenic sufficient to kill a persistent drinker, as much as one sixth of a grain being found in a pint. The fact that arsenic is a cumulative poison makes it the more dangerous.

I have tasted glucose, bottled in San Francisco, and bearing the label "Los Angeles Orange-blossom Honey, Guaranteed Absolutely Pure," that was unadulterated (with honey) glucose. So very strong is its taste of sulphuric acid and brass that it could not be retained in the mouth. Now, if a teaspoonful of glucose in a pint of beer will kill a man, how long will it take the straight article, with a piece of comb honey inserted as a bait, to do the same work?

Murphys, Cal., Feb. 23.

[The statement of *The Medical Record* is quite in line with some tests I made on myself some years ago. For experimental purposes we purchased a small quantity of commercial glucose—the very same article that is used so largely for adulterating. I sampled this stuff repeatedly, taking sometimes a whole spoonful. It came very near inducing vomiting several times as a result of this tasting, and I was sick for two weeks. My whole digestive apparatus had become disarranged; and no one can make me believe it was not the poison in the glucose—the sulphuric acid, the arsenic, and every thing else that is used in its manufacture. The greed of the manufacturers is so great they do not stop to clarify the cheaper grades they put out. By paying enough, one can get a good grade; but the mixers do not find the better goods so profitable, and therefore use the very cheapest because it "looks all right."

I was very sorry to see in the *Ohio Merchant* an admission from Prof. H. W. Wiley, Chief Chemist of the U. S. Department of Agriculture, as to the wholesomeness of glucose. While I indorse most heartily every thing he said in the article, there is one statement that I feel sure will do harm, because I do not think it can be true of the ordinary glucose—such stuff as is used for adulterating. He says in the article on page 24 of the periodical above mentioned:

> There is a distinction to be drawn between injurious and harmless adulterants. Certain falsifications have no bad effect upon the health of the consumer—as, for example, glucose, which is one of the most largely employed of all adulterants. Glucose is not at all unwholesome. It is prepared from India corn, and something like ten pounds of it are manufactured annually in the United States for every man, woman, and child in the country. There can be no objection to it, except that it pretends to be what it is not.

What Prof. Wiley doubtless alludes to is chemically pure glucose. The manufacturers of the stuff have probably sent him some for his inspection—the very best glucose that they can make, and from this he might base his statement as to its wholesomeness. But if he will, as did ourselves, go to the concerns that make a business of adulterating their wares with glucose, and analyze such an article, I feel positive he will find poison enough in it, in the way of arsenic and sulphuric acid, to upset the stomach of a pig. It is this vile glucose that is used so much in honey; and when these glucose-mixers masquerade their decoctions under the names of "Strictly Pure Honey," "Farmers' Honey," "Bees' Honey," and a dozen other honest names, the over-suspicious public conclude that, if *these* are honey, they will never buy another ounce, nor will they. It is this feature of the glucose business that disgusts consumers with all kinds of honey, and that is proving to be so damaging to the honey business of the United States.

I hope Prof. Wiley, whom I believe to be a friend of bee-keepers, and one who has done much for the cause of pure food, will have occasion to modify the statement, because he has before spoken of the wholesomeness of the syrup from corn.

Further on in the same article he says, "Maple syrup, so called, is nearly always falsified with other substances, and over 40 per cent of the strained honey sold is impure." This last statement is a little too strong. In some cities it is possibly true; but I doubt if there is anywhere in Ohio, under our present law and our present food commissioners, a place where there is even one per cent of glucosed honey; and Chicago, once the very hotbed of adulteration, has been compelled, on account of the new food commissioners, and the new law, to go out of the business, and sell only pure syrups and honeys.—ED]

RAMBLE NO. 183.

Life in a California Out-apiary; Effects of Heat on Hives, Covers, etc.

BY RAMBLER.

"Now while we are about it, Mr. Rambler, we will skip over to the out-apiary three and a half miles from here. Of course, you know that an out-apiary does not have all of the conveniences of a home apiary; but this one of mine will do; it is good for more or less honey. Here we are passing a creamery, as you will see by the milk-house and the silos. Such places mean a large acreage af alfalfa."

"I have noticed, Mr. McCubbin, that a large number of cattle seem to be crowded upon what I should call a small acreage. Here, you say, is an 80 acre alfalfa-field. How many cattle will that sustain?"

"Well, Mr. Rambler, if a good stand of alfalfa is secured in all parts of the field, and it is irrigated properly, the 80 will sustain 300 head of cattle; and, aside from running cattle for dairying, it is quite profitable to breed the cattle for beef. You can not help noticing that all the cattle in this country are sleek and plump, and ready for the shambles."

"Yes, I have noticed that; and the more pronounced, perhaps, for I have seen such emaciated and starving cattle during the dry seasons in the South; and another thing, Mr. McCubbin, I have not seen poor emaciated horses here; they are all plump and frisky—in fact, too fat for speed. And here we are at your out-apiary. What sort of crop do you call this around here?"

"That, Mr. Rambler, is an alkali weed. It grows rank, you observe, and, in its season, the bees get a little honey from it. Then there is a prickly alkali weed that gives a little honey."

"But, dear me! Mr. McCubbin, this is a desolate place—not a house within a mile; not a tree for shade; weeds, weeds; and if you have any hot weather it will strike right in here. There is nothing cheerful about this place."

"Oh! you will soon get used to the condition of things; and as to hot weather, it is only a matter of 115° or 120° when it gets down to it. When I first came here I declared that I would not work when the temperature got above 100; but when it did come I found myself working right along with the rest of the people."

"Mr. McCubbin, I notice you have quite a number of loose-jointed hives in your apiaries. See here. This hive wee-waws at least two inches out of square. Then just look at this cover. The top is made of four narrow strips, and no battens over the gaping cracks; and this one I am holding is rather loose-jointed. Jimminy Jericho! a bee-keeper down south would be ashamed to meet a looking-glass if he had such hives as that."

"Ha, ha! Why, Rambler, that hive and that cover are the desire of my heart. You see, when you place such a super on a hive you have to look all around it to see if it is on right. That, Mr. Rambler, teaches you to be circumspect; and if you are in relation to hives you will be in relation to bees and other things. Then these hive-bodies cost me but five cents each. I buy up all of the coal-oil cases I can, and a case makes a hive-body; and a case that is not fit to make a body will make a cover; and any thing that is not fit to make a cover will make a bottom; and any portion not fit for a bottom I use for kindling-wood."

"And do you have much kindling-wood out of it, Mr. McCubbin?"

"Well, no; kindling-wood *is* rather scarce around here; but, as I was going to say, a two-story hive with cover and bottom cost me about 20 cents without the frames. The latter I get cut at a planing-mill, and I suppose you think that covers with three big cracks across the top will leak when the rain comes; but, keep your eye on 'em, Rambler, and you will learn something about covers."

"JUST LOOK AT THIS COVER."

"But, see here, Mr. McCubbin; it distresses me greatly to look at this cover. I suppose you have a hammer here. I will nail it into some shape. Then, this hive-body with 'This will not explode' printed on the outside needs a little nailing, for it does look a little as though there had been an explosion inside of it."

"I do not keep hammers lying around loose, Mr. Rambler; but here is a harrow-tooth with which I do my nailing."

"Land o'Goshen! harrow-tooth! Who can drive nails with a harrow-tooth? No wonder your hives are wee-waw, and covers see saw. Why, down south if a bee-keeper had only an ax and a harrow-tooth for a kit of tools he'd be ashamed to meet a—"

"Yes, yes; but, see here, Rambler; you have lived too long in the South. Those fel-

lows down there have spoiled you. Next we know you'll want the whole earth. Who wants a better tool to drive a nail with than a good harrow-tooth?"

Mr. McCubbin and I discussed these matters, both in a happy frame of mind; and, though we differed on some points, there were enough upon which we did agree so we found we could work harmoniously for the production of honey; and as the cover question is under discussion between us, and is a question

AN APIARY IN A WEED-PATCH; A MULE MIRAGE.

of no mean importance, I wish to give some ideas in that line that I have gleaned from connection with many bee-keepers.

First, I show you a half-tone of our out-apiary. It is located in the midst of a rank growth of alkali weeds. A good share of the covers on these hives are of the cracked kind; but between the covers and the frames, a grain-sack is spread. One would naturally suppose that such a cover, or combination of sack and cover, would leak like a sieve. Later in the season, after 24 hours of steady downpour of rain, I went out to examine these wonderful covers and their capacity for turning water into the hive. To my surprise I found the bees on deck, ready for business as soon as I turned back the sack. The cracks in the cover had swelled tight, and only a little of the water from the first hour of rain had penetrated the hive. The sack was soaking wet; but as there was ample ventilation above, as soon as the cover dried and the cracks opened, the sack soon dried, and all was well with the bees.

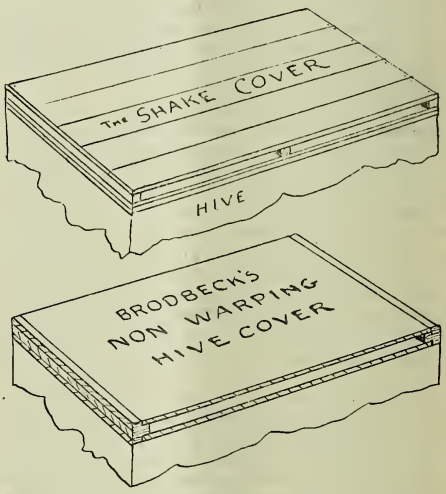
The out-apiary is also provided with a honey-house with a cover in keeping with the cover on the hives; but when you consider that, all through the working season, there is no rain, tight covers to hives and houses are not the most essential thing. This is also the country of the mirage. In the case of this apiary it is a mule mirage. These mules were much interested in bee-keeping and photography, and, though the apiary was in their pasture lot, a couple of strands of barbed wire kept them at proper distance. When working alone in the apiary under the hot sun of Central California it was a pleasure to have occasionally the companionship of a mule mirage.

From the comparing of notes with a good number of bee-keepers I know they prefer a tight even-fitting cover; but how to get it is the next question.

A few years ago the Higginsville cover received some attention, and it may be a good cover for some localities; but for this country, and made with a thin edge as I have used them, it is a failure, for that thin edge soon warps, leaving an opening several inches in length.

A whole-board cover, with clamps at the ends, is probably the cover most extensively used; but these will warp, and especially when made wide enough for a ten-frame hive. Redwood covers hold their shape in this country better than pine or any other variety of wood. Wide lumber is expensive, and the crying want is for something cheap and perfect.

Mr. Brodbeck, of Los Angeles, uses a cover which he assures me will not warp, and, to his mind, is near perfection. It is not, however, any cheaper than the ordinary wide covers, for it is made by resawing a wide board into boards ⅜ inch thick, and placing between them ⅞-inch cross-pieces, making in reality a combination cover and shade-board, and it can be used either side up. The accompanying cut will show the method of construction.



Another very good cheap non-warpable cover is made as follows: As previously mentioned, redwood, so plentiful on this coast, is not so liable to warp as other woods. Redwood shakes are used extensively for covering buildings, making raisin-trays, etc. They are sawed about ⅜ inch thick, and 4 inches wide. Cut these the desired length for the cover;

provide three pieces of board ⅞ inch square, as long as you desire the width of the cover, one at each end and one in the center. If your cover is to be 12 inches wide, nail three shakes, crowding them close together, to the end and center pieces. Then nail another set over the first, breaking joints. This will necessitate splitting a shake. When these are nailed on firmly, turn the cross-strips up and nail another set on that side, single layer, but breaking joints with the ones below. This makes a light durable cover; and I am told by J. H. Miller, of Los Angeles, who uses them, that they do not get out of shape.

The cover is much in appearance like Brodbeck's, but it is cheaper. This cover also acts as shade-board as well as cover; and in Central California, although the heat is sometimes great, there are practically no shade-boards used; and in the location where I spent the summer there are no stones on the hives. A very sufficient reason is in the fact that there is not a stone large enough to throw at a dog, in an area of many square miles.

[All through Colorado I saw the effect of the dry climate and the dazzling sun on hive-covers and hive-bodies. Even the very best of hives, made in the best factories, would have a fashion of pulling apart, nails sticking out, and boards checking and warping in a manner that would make one who had seen these goods before they left the factory almost weep. One can scarcely realize the effect of such a climate until he has seen the work of the elements with his own eyes.

In a warm climate a good dashing rain will do very little harm to a colony of bees, even if the water pours right down through on to them; and I suppose the purpose of a hive in California is not so much to keep out rain as it is to shut out the direct rays of the sun, and to afford a receptacle in which the bees may be held for the purpose of moving from one place to another. At such times it is important to have the hive reasonably strong and tight. The few bees that might escape from a hive loaded, with a lot of other hives on a wagon, *en route* over the mountain roads, would be apt to make a bad mess of the whole load in case they should get at the horses.

In the department of Special Notices in this issue will be found a description of a new hive-cover that The A. I. Root Co. has recently adopted for excessively hot climates, or climates that are severe on lumber, causing it to shrink and swell badly. A paper protection to cover up the big cracks in cover-boards will, I believe, come more and more into general use.

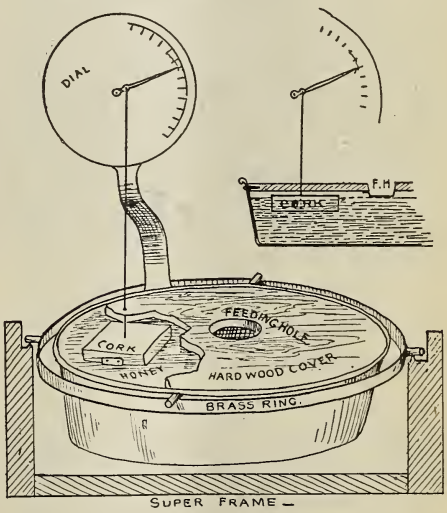
We have made covers on special order for various bee-keepers, on the plan of the Brodbeck and "shake" hive-covers. These covers, when covered with a special grade of roofing-paper, will prove to be very serviceable in any locality; will be proof against extremes of heat from the sun, and the cold of our northern States during winter. This question of cover is something that will have to be decided largely by conditions and locality. It may be said, however, that a cover that will stand a hot dry climate would also be serviceable for any other climate.—ED.]

SWARTHMORE'S GLOSSOMETER.

How to Measure the Tongues of a Whole Colony of Bees.

BY SWARTHMORE.

It is a sort of meter that I have devised, constructed as follows: A dish of tin is balanced in a box just like a compass, by use of wire nails and solder, strips of brass, etc. The top of the dish is covered with hard wood nailed on firmly. In the middle of this cover is bored a one inch hole, which is covered on its under side with wire cloth Off to one side is a float of cork having a piece of strap steel attached to its under side, in the middle. A small hole is pierced through the pan cover, and a knitting-needle is pushed down into the cork until it strikes the steel plate. A dial is constructed above the pan-cover, upon which is adjusted a recording hand, and the knitting-needle then fits into a little impression close to its center in such a way that the rise and fall of the cork will force the needle up and down, and, being at such a long lever-



age, the hundredth part of an inch will make an eighth or more at the end of the hand.

Fill the tin pan with thin honey and allow it to stand long enough to soak the cork thoroughly, then place the instrument on top of the frames of the colony to be measured, and cover all with an upper story. The bees will suck up the syrup through the meshes of the wire, and the cork will gradually sink. The needle will, of course, follow; and by lines on the dial the hundredths may be plainly seen. Move the instrument from hive to hive.

I have found among my golden-all-over stock, reared this season, bees with extreme length of tongue—from .23 to .25½. By re-

peated tests with the wire-cage method I find that the full length of tongue is put out by the bees through the wire.

[The general scheme of your measuring-device is very ingenious; but after all it would measure only the longest tongued bees in a colony. There is a slight variation in tongue-reach in bees of the same colony, and this variation is more with the bees of some queens than with others. But for real accuracy I question whether so much machinery would give the results as satisfactorily as a more simple device. For instance, the dial pointer would have to be very nicely balanced on a delicate hair-spring, with a slight tendency to move toward the zero-point. Then the string or thread reaching from the top of the needle to the point in the dial might vary a trifle in length. Any fibrous filament will vary in length according to the weather; and while it might be possible for you to use a fine wire, yet the stiffness of it would destroy to a certain extent the freedom of movement of the pointer on the dial.

You say that, by repeated test by the wire-cloth method, you find that the whole length of the tongue is put out by the bees through the wire cloth. From a physiological point of view I do not see how this is possible, any more than it is possible for us to stick our tongues the entire length clear out of our mouths. But perhaps you measure from one point of view, and we from another; and, again, your wire cloth may be sufficiently coarse so that a bee can actually stick its nose or mandibles *down through* the meshes. This would add somewhat to the tongue-reach. If so, this would hardly be a fair comparison, for the corolla-tubes of red clover that I have examined would not admit any portion of the mandibles with the tongue.—ED.]

PRACTICAL IMPROVEMENT.

Longevity vs. Long Tongues.

BY J. O. GRIMSLEY.

An invalid is not expected to be very impressive in the discussion of even the most interesting subjects; but I, for one, am like the good old woman at a camp-meeting, especially when I am devouring (mentally) the last few copies of GLEANINGS. I "get full, and must have a say." But you all are not around to hear the expressions of approval, and to see the accompanying smile, and I have to resort to the columns of GLEANINGS.

MEASURING TONGUES.

Well, that's business. Seems to me I said something once before on the same subject. But, oh what a crank I am on long tongues! Long-tongued women are an—an—abomination; long-tongued bees, the ideal of the bee-keeper. But, had you thought how queer the people are? We have a long and tedious road ahead, and the by-paths are numerous, and catch many travelers. The most prominent by-path has a large sign marked, "Color;" another says "Gentleness;" another, "Comb-building," and besides these we find various signs. However, to those looking ahead—in the straight and narrow way—is visible, in unmistakable letters, the ideal, "Long tongues."

In the first place, The A. I. Root Co. will not—can not, in fact—sell even a majority of the queens sold in the United States. If they could, then they could afford to say, "No queens will be sold which are not from a breeder whose workers have a reach of at least $\frac{20}{100}$ inch, and no breeding queen will be sold whose workers show a reach of less than $\frac{19}{100}$ or $\frac{20}{100}$ inch."

The various queen-breeders have their customers. In order to be successful at any business a man must "cater to the whims" of his patrons, who generally have ideas of their own, and it is no small undertaking to set their heads straight on their shoulders. For that reason most of the queen-breeders are making a specialty of golden Italians.

Now, don't understand me to say that yellow bees do not have long tongues. From personal experience I can't say, having given them only a limited trial, and I do not feel justified in condemning them unless I know. In fact, I can not see why they should not be well developed in that point. Why not? They are color sports; and if they have a tendency to sport in one point, why not in another? But for a success with long tongues we should not let color or any thing else be in the way. Line breeding — from both drone and queen — will eventually establish a long tongue, and then if there are undesirable traits they can be bred out by selection.

Now, who is going to do that? The Root Co. can't do it by themselves, neither can any other breeder or small number of breeders. I mean that it can't be done in any reasonable length of time.

Those who *buy* queens must put their shoulder to the wheels, and demand queens from long-tongued stock. Or, let's see; can't the breeders take one step forward by breeding from long-tongued stock, and "talking it" to their customers? Why not?

But there is another thing that puzzles me to some extent. It is plain to me that some bees—I will say strains of bees—are longer-lived than others, and it seems to me that short-lived long-tongued bees would be no better than long-lived medium-tongued bees, especially during a continued or even an average honey-flow. Now, how are we to determine whether a strain of bees are short-lived or long-lived? But may be I am carrying my quiz too far. However, there is a point to consider. In talking about long-tongued bees we notice that they are often called "red-clover bees," which is, in a sense, misleading. It is true that red clover would become a leading honey-plant if we had a strain of bees with tongues that would reach the nectar; but there are certainly hundreds of other nectar-secreting flowers that are barely out of reach at present, and would furnish honey if we had the long-tongued bees. For that reason I think the term "red clover" should be

dropped. Well, for a fact many bee-keepers that are not right to the front in every thing kind o' look on the term "red-clover queen" as being a synonym for "humbug."

Let color do her best, and gentleness have its day; but rest assured that the bee-keeping world is making the grandest stride in its history by falling in line with the long-tongue movement.

Beeville, Tenn.

PREVENTION OF SWARMING.

More about those "Brushed Swarms;" Large Hives and Under what Conditions they will Check or Curtail Swarming.

BY L. STACHELHAUSEN.

In Stray Straws, Nov. 15, Dr. C. C. Miller says that my article, p. 840, is not plain enough where I said, "Some time the next day. . . the lower story of the brood-chamber is removed." In the third line of that article I said, "For my management a two-story brood-chamber is needed." In fact, I use two 5¾-inch ten-frame supers as a brood-chamber. If a swarm is brushed I give at first two such supers with frames—containing starters only—because the bees will stay better and will cluster more readily if the hive is large enough for the swarm. I remove one of these stories the next day, because the swarm will build all worker-cells if the brood-chamber is small. Besides this I give a brood-comb when the swarm is framed, and remove it the next day. This brood-comb is not absolutely necessary, but the bees will sooner cluster around this comb, and will conduct themselves quieter. When the bees are not very much inclined to swarm, this brood comb can remain in the hive; but some years I have to remove the brood-combs the same evening or the next morning, or the whole colony will sometimes swarm out and abscond if nobody is present to rehive it.

All this is of minor importance, and according to circumstances we can proceed differently. The essential part of the management is, that the colony is brought into the condition of a swarm; and the purpose of so doing is, first, to avoid all natural swarming (an important item for out-apiaries); and, second, to fix the colony at the proper time in the best condition for storing honey in the supers. The plan is very similar to that described by H. Lathrop, pages 684 and 872, and by A. Norton, page 873. In the *Progressive*, F. L. Thompson describes another very similar way.

By an experience of many years I know how to avoid the absconding of these swarms as described above. The plan described by A. C. Miller, in the *Review*, and mentioned in GLEANINGS, page 921, is essentially the same as that described by me, and differs in details only. So far as I know, the first bee-keeper who recommended the forming of swarms by brushing the bees from the combs into a new hive, and setting this hive on the stand of the parent colony, or on a new stand, was the late C. J. H. Gravenhorst, in Germany, well known to the older readers of GLEANINGS, for which journal he has written many interesting articles. We have only changed his method according to our hives, and utilized it for the production of comb honey in sections.

I have to mention again an advantage of this management. By using large brood-chambers, or by enlarging smaller ones by giving shallow extracting-supers at the right time, we can prevent swarming to a certain extent; and my observation during about 18 years is the same as Mr. Lathrop's—that from year to year the bees will be less inclined to swarm, if large hives are used in this way. This advantage of large hives is doubted by some bee-keepers, some of them going as far as to say this non-swarming theory is a farce. The fact is, some years and some localities are so favorable for brood-rearing, and consequently for swarming, that even a colony worked for extracted honey in a very large hive filled with combs will occasionally swarm. If I find so much brood in a certain hive that a simple calculation will show that the queen must have laid 3000 or more eggs daily on an average for 21 days, I know at once that this colony will probably swarm, no matter how many supers I add. Only the commencement of a very good and fast honey-flow will prevent swarming in such colonies.

To explain this it would be necessary to give a whole theory on swarming. Here I will say that a colony will swarm under the same circumstances as soon as the number of eggs laid daily by the queen remains the same, or is diminishing from any cause. As long as this number is increasing, no swarm need be expected. See GLEANINGS, 1899, p. 926. If, in my out-apiaries, I find too much brood in my hives, I brush my colonies at once from the brood-combs and give them starters only. With colonies worked for extracted honey this is necessary only in extremely good years. With colonies worked for comb honey I do this brushing as soon as the main honey-flow commences, for the purpose of getting the colony in the best condition to start to work in the sections, and at the same time prevent swarming.

If large hives are used to prevent swarming, we have to consider that a large hive should contain a large number of empty cells in which the queen can lay eggs. I know that a colony in a large hive only half filled with combs may swarm, especially if the queen is old. It is not the large hive itself that prevents swarming; but the large number of empty cells available for the queen will prevent swarming, and even this is true to a reasonable extent only, as mentioned above.

Converse, Texas, Dec. 12.

DOMINICA, THE SWITZERLAND OF THE WEST INDIES.

BY W. K. MORRISON.

St. Pierre, Martinique, was the next stopping-place of our steamer the Solent, of the West India Royal Mail. Ever since reading Pere Labat's book on the West Indies, and

Lafcadio Hearn's splendid "Two Years in the French West Indies," I have been anxious to visit Martinique, and now my wish was to be gratified. Before us lay the high peaks of the land of Josephine, the Creole Empress who held in herself the destinies of Napoleon and of France. Fort de France we could see in the distance, with the everlasting three masted American schooner anchored in the offing to indicate the nearness of a more progressive civilization than that of France. I fancied I could see Trios Islets, the birthplace and childhood home of Josephine. Looking at the high peaks of Martinique, and musing inwardly on the somber aspect of the Morne Peelee, I thought, "What a land for romance, especially in the days when old Spain, France, and Britain fought desperate sea-fights for the possession of the new world!" Near by, Admiral Rodney smashed the whole French fleet which had eluded him to assist Washington at Yorktown. Quite near we could see, from the deck of the Solent, Diamond Rock, famous in story as His Majesty's ship Diamond. It was taken by the British fleet, and guns and sailors placed on it, conducted as a man-o'-war, and uniformly annoyed the French. Nowadays when the British fleet sail by, Diamond Rock is saluted with all the elaborateness of naval etiquette.

As our stay was to be short, I made haste to get on *terra firma*, and marched up and down the streets of St. Pierre. The shops and stores are good, and many of the houses are handsome and spacious, and thoroughly French. None of the storekeepers could speak English, and, try as I could, I could not purchase a single picture of the place. Even Josephine's statue seems to be unphotographed. I called on a photographer, but he had none but portraits of uninteresting people. He was a dentist and clock-fixer as well as photographer. The stores are excellent, however, and well stocked with the latest French conceptions. The streets are beautifully paved, and streams of water run down them all, to carry off effluvia. The streets are lighted by electricity; and a comical street-car, carrying eight persons drawn by a branded mule, solemnly does the duty of a trolly car. I visited the cathedral, and saw the ebony worshipers at their devotions—poor black women probably trying to console themselves for the loss of a dear child, though they had to work hard to find it bread. I came away saying to myself, "It's all French." Then our good ship Solent, with 50 English tourists, headed straight for Dominica, the Switzerland of the West Indies, only three hours distant. Ere long we could see its dim outline, and then nearer, till we could see the giant peaks, the tops hidden by the clouds. Columbus, who discovered Dominica, in trying to describe to Queen Isabella the configuration of the land took a piece of paper, and, crumpling it in his hand, laid it on the table as an illustration of Dominica's outline, and this well conveys the idea of serrated peaks and jagged crests; but it by no means conveys to the mind any idea of the somber grandeur of this tropical paradise.

Soon we reached Roseau, the chief town of the island; but before reaching it I noted, by the spy-glass, that the flags on shore were all at half-mast; and on conveying this news to my fellow-passengers all said, "The Queen is dead," and a damper was put on the spirits of all on board. Getting nearer we could hear the church-bells tolling, which caused a further depression.

I was soon ashore, safely ensconced at Mrs. Ogilvey's hotel, whence I purposed to explore and define the possibilities and capabilities of Dominica as a bee country. But I will defer my account to the next issue.

TOO MUCH POLLEN.

A knock at the door. Mrs. D. requests that I open it, as she is very busy with her hands in the dough, kneading what is to be the bread for dinner. So I go and open the door. There I find a man who says he has come across Skaneateles Lake on the ice to see me. I invite him in, and he says his name is Wilbur.

"But were you not afraid to cross the ice? Do you not know that the ice is always treacherous on that lake? and that there is scarcely a year, when it freezes over, but one or more are drowned from venturing on it?" are the first questions I ask.

"I was not aware that the ice on Skaneateles Lake was any more treacherous than on any other lake. What makes it so?"

"Skaneateles Lake is made up largely from springs which come up under the surface of the water; and as these springs throw up warmer water than that in the lake proper will average, ice does not form so thick over these springs, and is constantly getting thinner, as soon as our zero weather has passed by; and, not knowing where these springs are, the traveler walks on these thin places, only to drop in when least expected; and, unless help comes to the rescue soon, or the traveler has a long pole in his hand so it will catch on the unbroken ice, drowning is the result"

"Thank you for the information. I will take a pole with me when I go back, as it is thawing quite rapidly. But I came over to see you regarding some combs which have too much pollen in them, according to my way of thinking. Is there any way of removing pollen from combs?"

"In some localities bees store so much pollen in their combs that it seems to some that it would be better to have it removed. But I hardly think there is any locality where too much pollen is really stored."

"Could not a machine be invented for its removal?"

"Possibly. I was once at a bee convention where a man offered as high as $25 for a machine to remove pollen from the combs, but I never knew of such machine being invented."

"If there is no machine for removing it, is there not some other way of getting rid of it?"

"Some advise making combs containing much pollen into wax, and then have the wax worked into comb foundation, putting the same into the hives for the bees to draw out into comb again; but all such advice seems to me to be a damage rather than a help."

"Perhaps you do not have much pollen here, and so do not know what it is to have combs almost solid with pollen."

"In this locality we get large quantities of pollen, probably as much as is gathered in any place in the United States; yet I have never melted up a comb on that account, neither did I ever have any thrown out by the bees, as others claim they have, unless said pollen had become moldy."

"When does your pollen come?"

"With me there are two different periods that bees store very much more pollen than is worked up by the nurse-bees into chyle for the young brood. One is during the bloom of the hard maple, and the other during white-clover bloom I have had combs of pollen gathered during the yield from hard maple, which weighed as high as four pounds."

"That is like some I have. And if there is no machine to take it out of the cells, and you do not wish to melt the combs, how do you get rid of it?"

"At such times as this I work as follows: Whenever the bees gather so much as to crowd the queen I take it away for the time being, substituting empty combs for those taken away.

"If there come a few rainy or windy days at this time, I find that this pollen is all exhausted, so that the cells are once more empty or filled with eggs, as it takes large quantities of food for the numerous brood at this season of the year."

"But where you take away such combs full of pollen, what do you do with it? That is what has puzzled me, for it soon gets wormy."

"After apple-bloom there is little for the bees to work on for some two or three weeks, and the surplus pollen is all soon used up and more needed, when I set back that which was removed, and thus brood-rearing is kept up more effectually than by feeding syrup, honey, or any of the many plans for stimulative feeding, and costs very much less by way of outlay in either cash or labor. I consider plenty of pollen in the combs during the period of scarcity between apple and clover, or in any other time of scarcity, to be of great advantage."

"Well, I had never thought that these combs of pollen could be turned to advantage, and I now see my mistake. But how about that which comes from clover?"

"The pollen gathered during white-clover bloom is treated differently from that gathered early. That gathered early rarely ever has honey placed on top of it, while that from clover is placed in the cells till they are nearly three fourths full, when the remaining portion of the cell is filled with honey and sealed over so as to preserve it against a time of need the next spring, or some future time. During summer, as I find combs containing much pollen in this preserved state, they are hung away in my room for storing combs, and sulphured as occasion may require, to kill the larvæ of the wax-moth, which are sure to injure such combs much if not thus treated."

"If this pollen is covered with honey, and the cells sealed over, as you state, how do you tell them from combs of solid honey?"

"Combs containing pollen under honey are readily distinguished from those without by holding them up before a strong light and looking through them, especially if the combs are somewhat new. Then combs containing pollen of any amount are not so heavy according to their appearance as those solid with honey. Taking the two together I have no trouble in ascertaining those containing enough pollen to bother with."

"What do you do with these combs after storing them away?"

"When spring opens I again take the opportunity of placing such combs on hand, which contain pollen under honey, near the brood, and in doing so break the capping to the cells where they come next to the brood, by passing a knife flatwise over them, and find that there is nothing which will stimulate very early brood-rearing equal to this. This answers a very much better purpose to stimulate brood-rearing at this time of the year than the feeding of rye or oat meal, as some recommend. In this way all pollen is used up to far better advantage than by melting up the combs or by inventing a machine to remove it from the combs."

"That looks reasonable, and I have quite changed my views in this matter."

"The successful apiarist is the one who always studies hard to turn every thing that comes along so it will forward his pursuit, either directly or indirectly. Let us look wisely into all of the little matters which come along, and then we shall prosper."

A HOUSE-APIARY AND WORK-SHOP COMBINED; QUESTIONS FOR GLEANINGS.

Would it be practicable to put up a building that would accommodate 100 colonies of bees for summer and winter, and also use one end for a honey-house? The writer's idea was to put up a building, say 65 feet long and 10 feet wide, and use 15 feet at one end as a honey-room, and have the other 50 feet used for the bees two tiers high on each side, and the building double-walled, and packed with sawdust with an entrance through the side for each hive.

The advantages of such a building, if practicable, would be numerous, such as shade for bees and apiarist in summer; practically no walking or carrying honey, no packing and

unpacking hives in spring and fall; every hive perfectly dry and warm at all times, and the satisfaction of being able to lock up your hives, bees, and all, should you desire to go away for a day or two—no double-walled hives to make, no winter-cases, no grass to cut, and very few if any angry bees to bother the apiarist.

Would there be any loss of bees worth speaking of if there were an alighting-board, say one foot wide, run along the whole building, and the front of the building at every third hive painted a different color? Hives, of course, would have to be placed close together for economy of space inside. Would the different colors in painting referred to above be an advantage or not?

Would a building like this not give something of the uniform temperature of the cellar, coupled with the advantages of outdoor wintering? A. L.

[Such a building would be, I think, entirely practicable; indeed, we came very near constructing such a one at our outyard last fall, and probably will do so the coming season.

Of course, it is very important that the walls be double, and the space between packed with sawdust or shavings.

There should be a separate alighting-board for each entrance, and it would be better if they were of varied design to better enable the bees to find their several entrances. I would, for the same purpose, use the different colors of paint.

So far as uniformity of temperature is concerned it could not be as even as in a cellar entirely under ground.

Hives inside should be movable, and exactly like those outdoors, and should rest on shelves the same as is shown in the house-apiary used by F. A. Salisbury, described in the A B C of Bee Culture. Indeed, you will do well to follow this plan clear through, except that the building be double-walled.

The work-shop part can be added on the end, and extended as far as desired.—ED.]

ANTIDOTE FOR THE AROMA OF BEE-STING POISON.

I want an antidote for the poisonous aroma (if that is a proper phrase) given off from honey-comb. I have handled bees and combs for a good many years. I have been stung thousands of times with no ill effects. Late last season my eyes, face, and ears began to swell whenever I handled combs for a few hours. My eyelids are affected the most, swelling nearly shut, and remaining so for several days. I have never heard of a similar experience—perhaps you have. If there is an antidote or preventive known that can be suggested, I want it. H. C. MOREHOUSE.

Boulder, Colo., Feb. 9.

[It was the Rev. L. L. Langstroth who, some ten years ago, related a similar experience, as to how he suffered from swelling, or an itching sensation, when in the spring or early summer he began work with the bees; but at the time no one else had been similarly troubled; but in later years our Mr. Spafford, who was employed by us to fill two or three different orders from a large homeopathic-supply house for 10,000 bee-stings each, complained that, on the last thousand stings he pulled, his face and eyes began to smart. There was a swelling and a general tingling sensation all over. The aroma of the poison affected him quite seriously, making him sick, so that he had to give up the job. It would appear that, when one gets a large quantity of this poison in his system, the *very aroma* of it later on seems to affect him.

As to a remedy or antidote I do not know of any thing that would give you relief; but very possibly a homeopathic physician—one who makes use of bee-sting poison known as *Apis mellifica*, might give you an antidote that would afford relief.—ED.]

POOLE'S ENTRANCE-CONTRACTOR.

I send you another small article which I consider to be handy in the apiary. It is a contrivance to contract the entrance of a hive in cold weather, or in the spring or fall. They are also good when the bees are inclined to rob. The entrance of the contractor can be made larger or smaller. JEROME POOLE.

Rockport, Mass., Jan. 23.

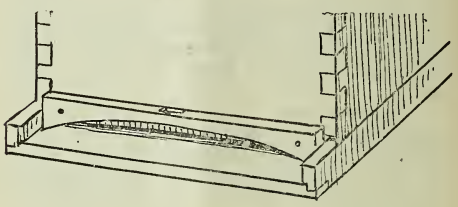


FIG. 1.

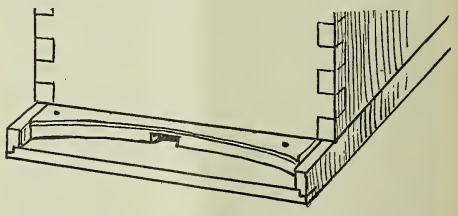


FIG. 2.

[The contractor, when put on as shown in Fig. 1, gives the greatest width of entrance. When placed as shown in Fig. 2, the smallest opening is given. This is something that any one can whittle out during these winter days. —ED.]

PARTNERSHIP IN KEEPING BEES, IN WHICH ONE OF THE PARTIES IS A NOVICE AND THE OTHER AN EXPERT BEE-KEEPER.

A friend of mine and myself are thinking of going to Colorado and engaging in the bee business, in partnership. He has had little or no experience in handling bees. I have had thirteen years of practical experience with them. What do you think he ought to put in

the business, extra, against my experience, this same extra to be divided equally between us if we should ever dissolve partnership? I write you, as I believe your judgment to be good in such matters.

Ottawa, Kan. J. Q. Adams.

[It is a little hard to give an answer; but perhaps we can arrive at a solution something in this way: Unskilled labor, in the case under consideration, should be placed, perhaps, at half of that of skilled. For instance, in Colorado, if a good experienced bee-keeper can earn $2.00 a day, a man who is learning the business ought not to have more than $1, if as much as that. But assuming that the beginner will be gathering experience and becoming more and more competent, we may assume that his labor will average at about half of the labor of the expert. Now, then, to your question. If the wages of an expert bee-keeper in dollars and cents—one who understands his business—is rated at $2 a day in Colorado, then your friend, considering that you are an expert, should receive half of the proceeds of the apiary less $1 per day for time actually spent by yourself.

A good deal of labor in an apiary that an expert would have to perform, the novice could do, such as lifting and carrying combs, brushing bees off the combs, turning the crank of the extractor; but, on the other hand, it should be considered that the unskilled labor would be worth perhaps $1 less per day, and possibly in some cases more than that without the skilled labor placed in co-operation. If your friend agrees to this kind of division then each of you should share equally in the expenses and the profits.—Ed.]

HIVING ON DRAWN COMBS.

Dr. C. C. Miller:—Owing to the extraordinarily poor seasons for the last three years, and the gradual dwindling away of many colonies, I am left with a large number of the ordinary-sized Hoffman brood-combs on my hands. It is possible that next season may surprise us by being a good one, and that I may have many swarms. Will you please advise us through Gleanings how drawn brood-combs may be used to the best advantage in hiving swarms? My practice has been heretofore, in the days when the seasons were good enough for the bees to swarm, to use brood-frames with starters of foundation, about four frames to a ten-frame Dovetailed hive; fill up the rest of the brood-nest with dummies, and put on the sections; but this season I shall have plenty of old brood-frames to use. Please advise how you would use them in hiving swarms to best advantage, giving details. Ben Avon.

[Dr. Miller replies:]

Using brood-combs fully drawn out, in place of foundation, need not call for a great deal of change in management, at least in the management you have been using. Whatever necessity you may have felt for limiting the frames of foundation to four when hiving a swarm, that necessity is emphasized when combs are used; for if the hive were filled with combs the bees would prefer to store in them in place of the super. Let the swarm be put on four combs; fill the dummies and place it on the old stand, with the mother colony close beside it, the super being transferred to the swarm. A week later move the mother colony to a new stand. Ten days after the time of swarming, four more combs may be put in the center of the brood-nest if it is an eight-frame hive. If it is a ten-frame hive, give three combs, putting on each side of these three combs two of the filled combs. Ten days later still, put three more combs in the center of the hive.

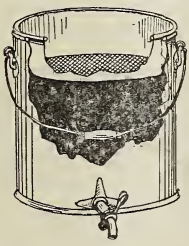
I do not speak with authority, as I have not used ten-frame hives for some years, and it may be that it would be all right to give five combs at first and the other five ten days later. C. C. Miller.

Marengo, Ill., Jan. 28.

A SIMPLE WAY TO STRAIN THE HONEY AS IT COMES FROM THE EXTRACTOR.

In the article of W. A. H. Gilstrap, Jan. 15, page 48, I see that he does not know how "Messrs. France and Coggshall can sell honey right from the extractor." Well, I do not know either; but I will tell how *I* do it.

I am using two cans, made as per illustration, to hold 5 gallons each. These are used under the extractor, one at a time. Each can has a strainer on top (an old-fashioned flour sifter, but finer wire), and a honey-gate at the bottom. As soon as the can is full, it is set up on a box, high enough to put a square can under the honey-gate of the can, and the honey is started to run into the lower can, when I go on extracting into the second can. In this way I do not need to watch, to keep the honey from running over, as it will do by filling from a tank, especially when one's mind is on something else at the time. I like this arrangement, especially for out-apiaries, as I can take home the honey as soon as extracted, and am not compelled to leave it in a tank unprotected on the desert or mountain range. I know of one bee-keeper, who has his honey-house at an elevation, who found his honey at the foot of the hill, losing several tons of honey, as some one had fired a rifle-ball through his tank, and in this way liberated the honey. This might have been great fun for the hunter, but certainly not for said bee keeper, who lost the larger part of his crop. M. R. Kuehne.



Pomona, Cal., Jan. 19.

[Your honey-strainer is doubtless a very serviceable and useful implement; but while it will separate out all the coarse particles of wax, propolis, bee-legs, pieces of wood, etc., it would not, I should suppose, catch the finer particles that will pass right through a sieve. These can be separated out only by gravity or

precipitation, while the honey was stored in a large settling-tank, after which drawing it off into square cans or barrels. But clarifying honey by precipitation is not necessary unless the honey is very light in color, and is used for bottling purposes.

I should like to receive an article from some of our large extracted-honey producers in this matter of clarifying extracted honey for market. Which is the more practicable—straining the honey *a la* Kuehne, or clarifying it by means of preciptation? And, by the way, this question of producing a crystalline extracted honey has not been very much discussed. Tell us the whole story.—ED.]

QUESTIONS ON WINTERING BEES.

Please answer the following questions, through GLEANINGS:

1. How large an entrance, and of what dimensions, should bees have that are wintered on their summer stands, without any packing except on top? Would it make any difference if they were wintered on closed-end brood-frames or in double-walled hives so far as the entrance is concerned?

2. How many pounds of comb honey would a colony average in an average locality, supposing it to be in good condition every spring, and not throw out any swarms? Make an estimate.

3. If I should give my honey a good sulphuring on taking it from the hives, would I have to sulphur it again?

4. What do you think of closed-end brood-frames the size of the Langstroth, for comb honey? Would they handle easily?

5. I have been troubled with my new swarms leaving their new hives and going to the woods. Could I prevent this by tacking "perforated zinc" over the entrance?

6. How would you manage outyards for comb honey when there is no one to watch for swarms? It seems to me if the entrance were covered with perforated zinc the queen would have to be replaced by a new one every two years or so, or she would be superseded by a young queen that could not get out of the hive to be fertilized.

I see you think it necessary, in cold climates, to winter bees in double-walled or chaff hives. I know of a man who has wintered his bees, for the past 20 years, in single-walled hives. He lays two sticks crosswise of the brood-frames, throws some old cloths over the sticks, packs them down tight, and his bees are ready for winter. His bees are protected from the cold winds by a windbreak of evergreens. They are in the best condition in the spring of any bees I know of, and we have quite a severe winter here too. The weather has played about zero for a spell of two weeks or more sometimes. BEGINNER.

Ashtabula Co., O.

[1. For outdoor wintering, an entrance $\frac{3}{8} \times 8$ inches for an average strong colony is about right. For a weaker colony, a shorter entrance in proportion should be used. Closed-end frames are certainly a pro ection, but the use of them would probably make no difference as to the size of the entrance.

2. It is pretty hard to give an average, as every thing depends on locality; but in Ohio, from 10 to 50 lbs., or, we will say, an average of 40 lbs. if we take a series of ten years.

3. Probably not.

4. A good deal depends on the style of the closed-end frames. One like the Danzenbaker would do very nicely in a hive as deep as the Langstroth; but one like the Heddon would not answer unless there were plenty of end play.

5. Clipping the wings of the queen, or using entrance-guards, would prevent swarms from going to the woods.

6. Different plans are used. Some clip the queen's wings; but this is unsatisfactory. Some use a hive so large that the brood-nests can not be cramped for room; but if the locality is not favorable, little if any comb honey would be secured. Some cage the queen or remove her entirely, and then destroy the cells in nine days and again in nine days. No one general plan can be recommended, because so much depends on the locality and the individual.

Queens would not be replaced if the colonies were looked after. The zinc should be removed after the honey season, and be kept off till it comes on again. It is true, bees can be wintered in single-walled hives outdoors in cold localities. There are exceptions to all good rules. In the case referred to, the windbreaks are over half the battle. Of two things, good windbreaks or double-walled hives, I think I would take the former.—ED.]

BEES AND ALFALFA HAY.

Do the bees lessen the value of alfalfa hay in any way by gathering nectar from its bloom before being cut for hay? Some of the cattle-raisers and ranchmen claim we should not keep bees, as they take for every pound of honey gathered from the alfalfa-bloom just that many pounds of fat off their beef cattle. While I do not think this is the case, I should be glad to have it explained by those in position to know the facts. J. E. PRYOR.

Eagalite, Colo., Jan. 28.

[The claim of the cattle-men is most silly and absurd. Show them a copy of the A B C book, and refer them to the article on fruit-blossoms, where there is any amount of proof to show that bees do a great deal of good in the setting and perfecting of most fruit. If they are of value to fruit they certainly would be, to say the least, not harmful to the growth of alfalfa hay. But here is a fact, and it stands uncontradicted: The first seed crop of red clover is usually not nearly as good as the second one, for the simple reason that the bees do not get at the blossoms of the first crop Here is another fact: The farmers of Australia were not able to grow red-clover seed until they imported bees. When they did so they could grow seed as well as we can here in America. It should be remembered that red clover and alfalfa are very near rela-

tives. If the bees were taken away from the alfalfa-fields entirely, you can tell your ranchmen that they would not be able to do very much in the way of growing alfalfa seed — ED.]

THE MEDICINE-DROPPER A SUCCESS FOR PICKING UP ROYAL JELLY.

We notice what is said in a recent issue of GLEANINGS in regard to using a dropper for supplying queen-cells with royal jelly. I will say that it will work to perfection, as we have used several for the past five years. In looking over nuclei we generally have one or more with us; and when we come across a queen-cell containing royal jelly, and which would have to be destroyed anyway, we just fill the dropper. Sometimes it takes five or six cells to fill a dropper; occasionally two will do. With a dropper supplied with the royal food one can prime cells in just a third of the time it requires with a quill; besides, the jelly can be kept in a dropper for several days; but we prefer it fresh.

Parkertown, O., Feb. 9. H. G. QUIRIN.

[I am glad to get this report, as I could not see any reason why a medicine-dropper would not handle the royal jelly much more rapidly, and deposit the exact quantity desired in each cell-cup. But A. C. Miller's experience was not so favorable.—ED.]

AN EXPERIENCE RESULTING IN FAVOR OF ABSORBENTS AS AGAINST SEALED COVERS FOR OUTDOOR WINTERING.

Mr. Editor:—I noticed in your Dec. 15th issue you request those in a position to do so to observe the conditions in which sealed covers and absorbents give best results. I winter my bees in tenement chaff hives, and I find they winter best, "in this locality," by removing the covers; then lay on some sticks or corncobs, and cover with burlap and chaff. I have sometimes put on a deep super or hive-body filled with chaff, then put on the cover; but even this seems to be a detriment, as it prevents the moisture from passing off.

With sealed covers in chaff hives, as soon as it becomes cold the combs become moldy, frost gathers on the inside of the hives, then when there is a thaw the frost melts, runs down over the combs, and stands in puddles on the bottom-boards.

I get best results in wintering by having the hives face the south or west, as the bees often fly on warm afternoons, toward spring, when those facing east do not. I also find it a good idea to take off the covers and stir up the chaff on such days.

INDOOR VS. OUTDOOR WINTERED BEES.

The majority of the large bee-keepers of this county winter their bees in the cellar; but I have heard some of them speak as though they were dissatisfied with that plan, and were looking with longing eyes toward outdoor wintering.

From some of Dr. Miller's writings I mistrust he feels something the same way. I think if he would try my plan of wintering he would find they would live through in good order, and be ahead of those wintered in the cellar at the beginning of the honey-flow. Is not at least a part of the extra food needed for outdoor wintering used in rearing brood before bees can be taken from the cellar safely?

Salem, N. Y. EARL Y. SAFFORD.

[There seems to be a growing apprehension among those who winter indoors, that, even though indoor bees consume less stores, yet the outdoor bees may be enough more vigorous to make up for the extra consumption of stores. I should be pleased to get further reports.—ED.]

THE USE OF THE BROOM SEDGE FOR BRUSHING BEES IN THE SOUTH.

Mrs. L. Harrison, in telling of southern broom sedge, p. 52, says, "I'm surprised that southern bee-keepers have not used them for this purpose, and told us about them." I suppose by "us" she means northern bee-keepers. Now, I should like to say that southern bee-keepers have used brooms of this kind for many years. Bees have been kept on our place, 6 miles east of Washington, N. C., for the last 60 or 75 years by my father and grandfather and myself. I have often seen my father, as far back as I can remember, use a broom of this kind.

Washington, N. C. J. R. PINKHAM.

LOADING CROSSWISE OR LENGTHWISE; GOOD PROOF.

E. R. Root:—I was surprised when I read your editorial in GLEANINGS for Nov. 15 on how to load honey on a wagon, as I supposed everybody thought the combs should run *across* the wagon and not lengthwise. I notice Mr. Hutchinson, in the *Review*, thinks it should be loaded the same as you say. There is no need of breaking honey that is fastened firmly to the wood, and properly crated, no matter which way it is loaded; but in hauling hives of bees or loose combs one has to be more careful. I moved an outyard last fall about one mile, but left over one hundred extracting-supers till I had more time. I moved the supers last week with a spring wagon; and as there isn't room in a common wagon-box to place two rows crosswise, I set one row of supers with combs running crosswise and one with combs running lengthwise of wagon. When I came to unload I found several combs broken in the row that was loaded lengthwise, but none in the supers that were loaded crosswise. That's the way it always works "in this locality," no matter what kind of roads. H. H. PORTER.

Baraboo, Wis., Dec. 20.

LOADING COMB HONEY ON A WAGON.

Dr. Miller's directions as to the right way to load comb honey on a wagon are correct, and will apply to all kinds of roads. When the roads are bad and the ruts deep, the chances are a hundred to one against there being two holes, one in each rut, *exactly* opposite one another, such as would produce a forward and

downward jolt. When, as is nearly always the case, only one wheel falls in a hole or strikes an obstruction, the result is a *side* jolt; and to guard against these the combs must be placed *across* the wagon. The only exception I can see to this rule would be in the case of a very steep hill; but by driving very carefully and slowly there would be but very little danger if any. My yards are 10 and 15 miles from the railroad, and I have hauled comb honey over as rough roads as can be found anywhere. I use springs under the load, and the broken sections have never amounted to any thing, the breakage being confined to those that were not well attached to the wood.

GUSTAVE GROSS.

Lake Mills, Wis., Jan. 7.

GLEANINGS FAMILY A PICKED COMPANY; GLEANINGS AS AN ADVERTISING MEDIUM.

I have received so many letters in answer to my request for information which you were so kind as to insert in a recent number of your paper that I find it utterly impossible to answer them all. I desire to thank my many unknown friends for their kind invitations to come to their neighborhoods, but of course I can go to but one place, and now I am in more of a quandary than ever as to where I had best locate. I have letters before me from people living in Wisconsin on the north to Florida on the south, and from New Jersey on the east to Utah on the west. It strikes me that your paper must have a wide and general circulation, and hence must surely be a good advertising medium. I have before me several offers of good apiaries and other preperty; and as I am not ready to buy I would suggest to the owners that they advertise it in GLEANINGS, as I am satisfied they will soon find a buyer. Judging by the kindly spirit pervading all these letters I believe the GLEANINGS family is "picked company."

HENRY DETMERS.

Carlsbad, N. M., Dec. 15.

EXTRACTED HONEY FROM DARK COMBS.

Is it an established fact that dark combs impart a dark color to the honey stored in them, as I understand Mr. Chalon Fowls to state? See page 960, Dec. 15, top of right-hand column. R. J. FOX.

Natick, Mass.

[I know there are some who say that old dark combs should not be used if one wishes to get a first-class article of white extracted honey. If they (the combs) do have any effect, the darkening is almost imperceptible. If one wishes to put a fine article of extracted honey on the market, or for exhibition purposes, or for a fancy trade, it would, perhaps, be better to have such honey stored in combs not more than three or four years old. I say it would *perhaps*. I do not know. I myself am inclined to believe that for *ordinary* marketing purposes old dark combs would answer as well as newer ones for the production of extracted honey. Of course, some combs might be stained by pollen, or they might come from hives on which bees had recently wintered. Such combs, of course, could not furnish a first-class article of extracted honey. —ED.]

HOW MANY DRONES DOES A COLONY REQUIRE?

How many drones do I need per colony? Perhaps the question is not plain. It is like this: I bought a few colonies of bees, and their increase has been put in hives where I used full sheets of brood foundation, so they have no drone comb whatever. Since reading your paper I have made up my mind that it is not a good plan to inbreed, so I am going to buy a few colonies of well-bred bees to raise drones from. I have 60 old colonies now. How many shall I buy to furnish drones?

A SUBSCRIBER.

Fort Lupton, Col., Jan. 28.

[I would pay no attention to the matter of drones, if you are working your bees for the production of honey. Even if you are rearing queens, one or two colonies of choice stock could rear all the drones you require. One great advantage of comb foundat on is that it restricts the useless rearing of a lot of drones, that are only consumers. The ordinary apiary, consisting of hives containing combs built off from foundation, even if there is not a drone-cell, *apparently*, in the hives, would have all the drones it needs for the fertilization of its queens during swarming time, or any other time, in fact, when bees can fly. —ED.]

HONEY COUGH MEDICINE.

Friend Root:—Why don't some of your great doctors tell us how to medicate honey for coughs, colds, and throat and lung troubles, and perhaps flavor too?

Dexter, Me. A. R. BODGE.

[You will find quite a number of recipes for honey cough preparations in our regular honey-leaflet, and under the heading of "Honey-cooking Recipes," in our A B C book. As these recipes were selected by C. C. Miller, an M. D, they are probably the very best known.—ED.]

FEEDING BACK FOR COMB HONEY; CONDITIONS UNDER WHICH IT MAY BE PRACTICED.

Will you tell me what per cent of extracted honey fed back can be obtained sealed in boxes, if none going into the brood-combs is taken into consideration, said boxes filled with foundation? F. H. CYRENIUS.

Oswego, N. Y.

[It is impossible to give an estimate of the percentage, as so much depends on the kind of honey fed back, the time of year, the kind of bees used, and the man. Mr. Hutchinson, who has had much experience, says it is important to get the right kind of colonies. Some stocks are away ahead of others; and in general the black bees are the best; the next best are hybrids, and the poorest are Italians. The combs in the brood-nest must

be new, or comparatively so, as old combs have a tendency to stain the sections above. The honey to be fed should be thinned by water to about the consistency of raw nectar. The hotter the weather, the better; and if there is ever a time when separators are needed it is in feeding back, because at such time bees are more liable to bulge the combs than when the honey comes from natural sources. Mr. Hutchinson's estimate is that, under the right conditions, and with the proper amount of experience, one will get back two-thirds of the honey fed before it is diluted. There are times when one might possibly get as much as 90 per cent; but I have seen reports from those who have lost as much as 50 per cent. Where all this excess of honey went to can not be definitely determined; but probably a large portion of it was consumed by the bees, and another portion was converted into wax. As a general rule, the average person had better let feeding back alone unless there is no demand for extracted honey, and a good demand for comb honey. There are times when it pays, and pays well; but as a rule, but little is gained.—Ed.]

PUTTING FOUNDATION INTO SECTIONS ON A CURVE.

I use the 3⅝x5 section with top and bottom starters put in with a hot-plate arrangement. To counteract the propensity of the long and narrow top starter to swing and fall out I give it a slight curve as I drop it from the hot plate on to the outstretched flat section. This stiffens it and enables it to support its own weight without becoming detached, even if lying on its side. This may be an old story to you. It would probably occur to everybody who puts in starters with a hot plate, but I have never seen it mentioned, and it is quite a help to me. G. Collier.

Warsaw, N. Y., Jan. 24.

[I should hardly suppose that the plan you propose would be practicable, for the simple reason that the combs would be inclined to follow the curve of the foundation itself, one side being slightly concave and the other a little convex. I think if you were to try the plan on a larger scale you would find it objectionable.—Ed.]

A SCHEME FOR MAKING DOUBLE-POCKET HONEY-EXTRACTORS.

Having just read W. A. H. Gilstrap's article, p. 48, Jan. 15, with what you say in the footnote in regard to improvement in construction of extractors, I wish to add a word. As I have used a four-frame Cowan extractor for the past three years, I can say that an eight-sided hoop for the baskets would be a great improvement, especially in the West, where we have so much thick honey. My comb-baskets have had to be overhauled and resoldered several times each season, and make me no end of trouble.

I conceived an idea for the construction of a comb-basket last summer. I don't know whether it's new or not. It is original with me at least; i. e., to make a basket double, holding two combs face to face, operated by a sheet of tin, so that, when the extractor is turned, the contents of one side of each comb are thrown against the tin partition instead of the extractor side. Get up two baskets side by side, with, say, an inch space between the two faces, and then set up a piece of tin between the two faces, and you will see the idea, I think.

By this plan a four-frame extractor would need to be but little larger than a two-frame as now made. The four-frame, as now made, is too heavy for one man to handle, and is hard to start and stop. L. B. Bell.

Camp Verde, A. T.

[The scheme of making double-pocket honey-extractors has been carried into general practice by the Goold, Shapley & Muir Co., of Brantford, Canada, for a number of years. It can be adapted to extractors of the Cowan type; in fact, we have an order on hand now for an extractor of that kind.—Ed.]

GILSTRAP'S TANK; ITS OBJECT FURTHER EXPLAINED.

Mr. Root:—Your footnote on page 49 calls for an explanation. My honey is *not white*. It ranges from saffron color to quite dark.

The principal object of a tank here, *decidedly*, is to give those "minute particles of wax" time to rise before being canned, for rise they will in spite of you. If the honey is put into cans before this scum (small pieces of wax) rises, the dealers refuse to buy the honey—that's all. W. A. H. Gilstrap.

Grayson, Cal., Jan. 29.

COMBS CROSSWISE OR PARALLEL WITH THE ENTRANCE.

Why should the brood-frames run from front to rear? I have tried in two colonies, each half of the hive. The result was, they removed the brood-nest to the rear of both colonies at the same time. Even the queen-cups were found where the comb ran sidewise in the rear of the colonies. My boxes are 14 ×22, 9½ deep inside; frames 8×13. I have half an inch below the brood-frames. That should give room enough to carry the dead bees out. It think it is a good point for bee-keepers, on account of the cold wind that strikes the bottom-board, and goes up directly between the brood-frames, and chills the brood. Will you please mention this in Gleanings? Where can I find the royal jelly to put into the queen-cups? My bees are Italians. H. F. Meese.

Rock Island, Ill., Feb. 25.

[This question, whether brood-frames should run at right angles to the entrance, or whether the edges shall point toward it, is one that was discussed years ago. It was the general consensus of opinion then that while, theoretically, there might be an advantage in having the combs crosswise of the entrance, yet, practically, colonies on frames running in the opposite direction did just as well, year in and year out. So far as the position of brood is

concerned in the late spring and early summer it will be placed at that end of the hive that is remote from the entrance, whether the frames are crosswise or in line with it. With wide deep entrances, it is perhaps a slight advantage to have the edges of the combs pointing toward the entrances, as the flying bees during the height of the honey-flow will fly through the entrance and alight on the cluster, just under the frames. If the honey is being stored on the right they will steer their flight toward the right, then pass directly upward. If combs are crosswise, the bees will be compelled to climb over from one frame to the other or else go to the side of the hive and then on to a frame where honey is stored. But Doolittle says flying bees do not generally deposit any honey; that they give it to nurse-bees which, in turn, transfer it to the combs. Taking it all in all, I think we may safely conclude that, between the two different ways of placing combs, it is about six of one and half a dozen of the other.

Royal jelly is found only in queen-cells. A cell well drawn out, and a good fat larva in it a day or two before it is capped, will contain royal jelly of about the right consistency.—ED]

M. S., Minn.—Your trouble with frost getting through the hives will be remedied by putting winter-cases over them, or packing them in some way with straw, chaff, or sawdust. Put outside of the packing-material, of course, something that would shed rain or snow. In your locality the bees should either be in the cellar or packed as described.

W. I. F. H., Pa.—If you have a superabundance of drones at this time of the year in your hives, I should suppose, from what you say, that you have either a drone-layer or a laying worker. Cyprian bees are better workers than Italians, but they are very cross; still, with the right degree of caution they can be handled. The best record of Cyprian bees is 750 lbs. from one colony.

C. L. L., Wis.—There is a great difference in honey about candying. Some honeys will candy within a few weeks or months, and others will remain clear for two years. At one time it was considered an infallible proof that if honey candied it was therefore pure; but it is now known that this is no test, for some pure honeys will remain clear for two or three years without any treatment whatever, under certain conditions.

J. S., Kan.—If your bees are short of stores, give them lumps of candy made by mixing granulated sugar, or, better, powdered sugar, and honey into a stiff dough, mixing in sugar till the dough is quite hard. Lay two lumps of this, about as large as the fist, over the frames of the colony. Cover the whole with a quilt or cushion, as the bees will fail to take the feed unless it is properly covered and protected. If you can get a nice grade of rock candy, free from coloring-matter or flavoring extracts, you can give this instead.

J. C. D., Pa.—Without knowing more about your locality, it is hard to say whether you should winter outdoors or indoors. If you have considerable zero weather, and most of the winter there is snow and a temperature below 32°, I would advise indoor wintering; but if you have but little zero weather lasting, say, a week, and a great deal of open weather, and a general range of temperature at freezing and above, I would recommend wintering in double-walled hives. For indoor wintering, a good dry cellar is about as good as any thing you can have; but the temperature in it should not be much above 50 nor below 40. While you can use a stove sometimes to raise the temperature, the general practice is to use none.

G. W. A., Mass—It is not wise to give bees liquid feed during mid-winter or late in the fall. If you have not combs of sealed stores, better give them cakes of candy. The first warm day you had better remove the feeder containing the syrup, close the brood-nest down to as small a capacity as possible, then lay on top of the frames pieces of rock candy made of cane sugar. The bees will winter very nicely on such candy, and get along far better than if you try to give them syrupy feed now. While the bees can eat a great many of the flavored candies, it will be far better for you to give them that which is pure, and free from flavoring and coloring matter as much as possible. For directions concerning how to make candy or winter feed, see our A B C of Bee Culture. Next spring, when you get settled warm weather, then you can feed syrup.

H. P. L., Ill.—As to which is the best honey-plant to grow when *honey alone* is considered, it is a hard question to answer. Locality has every thing to do with the matter. If it were in Colorado I think I would unhesitatingly recommend alfalfa. If for Ohio, I think I would name the Simpson, or spider plant; if it were California, the mountain sage; if Utah, sweet clover. Speaking of this, it might be well to state that sweet clover will grow in a greater number of localities than perhaps any other known honey-plant; and while it is difficult to make it grow as a plant when you want it to grow, yet it will spring up spontaneously in patches where nothing else will sprout.

But it should be well understood that no one can afford to grow *any honey-plant* for honey alone. The only ones that will do for artificial pasturage are those that are useful for either grain or hay as well as honey. Of these the principal ones I would name, then, would be alfalfa, buckwheat, and alsike.

BEES AND GRAPES; BEES NOT GUILTY.

J. A. H, Ohio.—Through the courtesy of Prof. W. J. Green, of the Ohio Experiment Station, Wooster, I have been permitted to see two letters which you wrote him in reference to alleged damages by bees to grapes.

From your letters I judge you to be a man of candor, and open to conviction; and, if so, I hope you will give some of the facts, that I am able to present, some consideration.

By our Feb. 1st issue of GLEANINGS IN BEE CULTURE, page 91, you will see there has just been litigated at Goshen, N. Y., a case that involved new principles in law—a case involving the question whether bees can or do puncture fruit. You will not only see that the case was a peculiarly hard-fought one, and attracted attention far and wide, but that *the bees were adjudged not guilty*.

I would call attention to an editorial in our journal in our issue for Feb. 15, page 152, a copy of which we send you; to another editorial on page 150 of the same issue; also to the following back numbers of our journal containing marked articles: Oct. 1, 1900; Nov. 15, 1896; Jan. 1, 1897.

You will find an article in the Feb. 15th issue, from H. L. Jeffrey, detailing some experiments that were conducted at the Connecticut Agricultural College.

If you will kindly take time to read the references you will see that bees have not yet been caught in the act of puncturing fruit. Some contend that it is a physical impossibility, owing to the structure of the mouth parts. Again, in every case, if I am correct, of alleged puncture or stinging we have found that birds or some kinds of insects, not bees, have first made the incisions, and that bees afterward helped on in the work of destruction. But as we bee-keepers affirm that fruit that has been punctured by birds or insects is worthless or practically so, and while we admit that bees are annoying at times, we deny that they are the original cause of destruction to fruit.

You will see by the marked items referred to above that I have personally seen the Cape May warbler in the act of puncturing fruit. The beak of this bird is very small and needle-like, and, as a general rule, the punctures are on the top side of the bunches as they hang on the vines. They will even hunt out the baskets of grapes that have already been picked and punctured them. There are about a dozen other birds that are special adepts in this practice. As they get in their bad work early in the morning, usually before any one is up, the bees come in later, run their tongues down into the small holes made by the birds, and suck the berries almost dry, and being observed at work over the punctures *get the credit for doing the whole mischief*. Now, to convince yourself that bees do not make fresh incisions, I would call attention to the fact that three or four, yes, five or six, will be circling around one hole, sometimes standing on top of each other, all running their tongues down into that same hole. If they could make fresh incisions, they would not crowd and jostle each other as they do; but each bee would make for itself a hole where it could work without being hampered in its efforts to extract the juices.

Believing you to be a candid man, as I have stated, and open to conviction, I should be very glad to respond to a telegram next summer or fall, when you find the bees puncturing the grapes; and while I shall not deny that they will feed upon broken, cracked, or punctured fruit, I think I can show you, if you will go out with me in the morning, that a bird or some insect is the original cause of the mischief.

Should you desire further information, I would refer you to Assistant Entomologist Prof. Frank Benton, of the Department of Agriculture, Washington, D. C. He has made this one subject a very thorough and exhaustive study. You will also find that all of the various experiment stations in the land that have gone into this matter at all have completely exonerated the bees.

NATIONAL BEE-KEEPERS' ASSOCIATION.

OBJECT:—Defense of the rights of bee-keepers; prosecution of dishonest commission men and glucose adulterators; but only members are entitled to protection.

OFFICERS:—E. R. Root, President, Medina, O.; R. C. Aikin, Vice-president Loveland, Col.; Dr. A. B. Mason, Secretary, 3512 Monroe St., Sta. B, Toledo, O.; Eugene Secor, Gen'l Manager, Forest City, Ia.

FEES:—Annual membership fee $1.00 Remittances may be sent here or to General Manager as above.

WE have just received notice that the father of Geo. W. York, editor of the *American Bee Journal*, died very suddenly at his home in Randolph, Ohio, March 4th. We extend to Mr. York our sympathies.

THE whole month of February was made up of what we would call here in the North delightful winter weather. In our locality the temperature never went below zero, and seldom did it go above freezing. If such weather should continue till the first of April we may expect an early spring.

CANE AND BEET SUGAR.

WANTED—an article on beet and cane sugar, from some one who is in position to tell us about the relative food value to human beings as well as to bees, and how much cane sugar there is on the market as compared with beet; if it is possible to buy a genuine cane sugar; and if so, how the one may be detected from the other by an ordinary bee-keeper. This article must come from some one who is in position to get information direct from both cane and beet sugar factories.

A CORRECTION.

BY a strange oversight and an inexcusable blunder on my part, I find that on page 102, in giving a list of the officers of the National Bee-keepers' Association, I omitted the name of Secretary Dr. A. B. Mason, Station B, Toledo, O. When I dictated the list I supposed I was giving the entire officiary, and was utterly ignorant of the omission until a

friend called my attention to it. Dr. A. B. Mason has been one of the most active in the support of the old Union, and latterly of the Association, of any member or officer we have ever had. It was he who drafted the constitution of the present organization, which, under its excellent provisions, is doing such good work. He served as president for two terms, and as secretary continuously for several years.

One can readily see that it was an oversight, as the notice at the head of this column was published in the very next issue following this unfortunate oversight, and again in the March 1st number.

SOMETHING TO LEARN IN INDOOR WINTERING.

THE bees under the machine-shop, of which I spoke in our last issue, are still doing very nicely. The more I think of it, the more I believe there is much to learn on this subject of indoor wintering. The fact that Ira Barber says he succeeds under conditions that seem to be utterly at variance with the experience of others, should merit sufficient attention to see if harmony can not finally be made out of all the conflict of opinion. If I remember correctly Mr. Barber maintains that even a high temperature is not detrimental, but that a fresh infusion of air direct from outdoors causes the bees uneasiness, hence they get out of the hives, and consequently losses occur on the cellar bottom. Our bees get no air except from the outer or main cellar, and the number of dead bees on the floor of the bee-cellar is surprisingly small.

JUDGING OF THE CIRCULATION OF A PERIODICAL; ADVERTISING IN GLEANINGS.

ONE can often judge of the circulation of a periodical by the class and amount of advertising seen in its pages. The subscription-list of GLEANINGS has been having a steady and healthy growth, and a very good proof of this is afforded by the large amount of clean advertising that will be found in our columns. The advertisers of the country are in the habit of keeping returns of every periodical they advertise in; and if such medium does not bring in a large list of applications, or enough to bring down the cost of each name to 10 or 25 cts., that medium is dropped from the list, and only those used which are able to show value received for the money invested. The large amount of advertising we now have shows that our advertisers have tried our columns, and find that it pays to keep in them. We have some who have been with us, not only many months but years.

PURE-FOOD COMMISSIONERS, AND HOW THEY CAN HELP BEE KEEPERS.

THE following letter, addressed to H. G. Acklin, President of the Minnesota State Bee-keepers' Association, will be read with special interest by all the bee-keepers of that State, and we are glad to place it before our readers:

Mr. H. G. Acklin:—If the bee interests of Minnesota will advise this office of all violations of the law relative to honey that come under their observation it will enable us to be of greater service to this industry than we can possibly otherwise.

Any information of this kind received could only be used by us in ferreting out and making up a case of our own.

It is, and will be, the purpose of this Department to protect as far as possible all products that are pure. With the co operation of our friends we hope to guard our pure foods from competition of spurious articles.

Very truly yours,
W. W. P. MCCONNELL,
Dairy and Food Commissioner.

St. Paul, Minn., Feb. 21.

Would there were more dairy and food commissioners who felt the same interest in the purity of the product of the hive. We have another good one in Illinois, and one in Ohio; but we need more. Most of these public servants would be glad to carry out the requests of bee-keepers; and I would suggest that our subscribers of the several States write to their commissioners, asking for assistance in the matter of prosecuting the adulterators of honey. A letter addressed to the Food Commissioner at your State capital will probably find your man.

THE LOGIC OF THE TIMES — TALL SECTIONS V. SQUARE ONES.

AS will be seen in Pickings in this issue, it appears that the tall and thin sections are receiving considerable attention from our British cousins. So far as I have been able to discover, their experience with regard to tall thin boxes is very strongly in line with the statements of those in this country who have given these special goods careful and extended trial. Our own orders from Great Britain, instead of being now so much for the 4¼ square, full 2 inches thick, are beginning to show a tendency toward the tall thin boxes, either four-beeway or plain. And, by the way, our British cousins were a long way ahead of us in discovering that sections with four openings were considerably better than those with simple openings at top and bottom. As they recognize the value of direct communication sidewise as well as up and down, so they were quick to perceive the advantages of the plain section and fence system. The time was, and that not ten years ago, to say the least, when square boxes, with one or two exceptions, were used almost exclusively throughout the United States, and now many bee-keepers right and left are beginning to see that there is money in the tall and thin boxes. I know of one particular case where a bee-keeper opposed the introduction of these new things, and particularly the tall section; but I learned recently that the hard logic of a cent or two difference in his own market, in favor of the tall box as against his own square section, convinced him that he could not afford to use the old-style one, and compelled him to use the very things which he had decried and despised. He is not saying any thing—he is keeping still and "sawing wood;" that is to say, he is buying tall sections, re-equipping his supers, and proposes to be on a level with his neighbors who have been getting a higher price than he.

Of course there are markets where no discrimination is made in price in the two kinds

of sections; but, if I mistake not, sooner or later the tall ones will be found the first ones to sell.

FERTILIZING QUEENS IN CONFINEMENT.

WHILE W. Z. Hutchinson and myself were riding on the cars *en route* to one of the conventions, he produced a manuscript; and as he did so he said he did not know but I would think he was foolish, but he was shortly to publish an article on the subject of fertilization of queens in confinement, and, what was more, he believed that, while the scheme had hitherto been considered visionary and impracticable, yet it had been abandoned prematurely. He had quite accidentally run across a man who, some ten years ago, had been successful in fertilizing 100 queens in confinement. Strangely enough this party never said any thing about it, in print.

To make a long story short, he read to me the manuscript, and then, with a look of inquiry on his face, he wished to know what I thought of the plan.

"Why," said I, "I am inclined to think there is something in it."

The article has, since our conversation, been published in *The Bee-keepers' Review* for February, and the man who succeeded in getting 100 queens fertilized is Mr. J. S. Daviett, of Aragon, Ga. In brief, the plan involves the erection of a large tent 30 feet in diameter and 30 feet high, the covering being of mosquito-netting. Mr. D. writes:

> Colonies of bees well supplied with drones were placed close up against the wall of the tent, on the outside, each colony being allowed two entrances. One entrance opened outside of the tent, and was contracted so that neither queens nor drones could pass, but allowed the workers to pass out and in, and work in the fields in the usual manner. The other entrance opened into the tent, and was large enough for the passage of a queen or drone; but it was kept closed or darkened for about a week after the colony was placed in position. This was done for the purpose of educating the workers to use the outside entrance. The drones were not allowed to use the outer entrance at any time, nor to enter the tent except from 11:00 A. M. until 1:30 P. M. After the drones had learned the bounds of the tent, they seemed contented, and made a very pretty school flying in the top of the tent. And I wish to say right here that the *drones* are the main feature of this problem. Once you get them *quiet* and *reconciled* to fly in the top of the tent, the problem is solved. Nine times out of ten the queen will not reach the top of the tent before receiving the most prompt and gushing attention. After I got the drones under control I had no difficulty. I simply turned in the queens from the hives they were in, just the same as I turned in the drones. I one year reared about 100 queens and had them mated in this tent. A queen would leave the mouth of the hive, and return in about five minutes, apparently mated; and in three or four days would be laying; and the progeny of all queens thus mated showed the same markings as the workers of the colonies from which the drones were taken.

It appears that Prof. N. W. McLain, several years ago, tried about the same plan, but succeeded only partially, and, what was more, the results at the time were regarded by the fraternity as a failure. But Prof. McLain still believes that a little further experiment would enable him to make the scheme work; but the following year the State Experiment Station at Aurora, Ill., was discontinued, and no further experiments along that line were conducted by any one, so far as is known, except, perhaps, by this Mr. Daviett, who has up to this time kept his candle under a bushel.

Prof. McLain attributed his failure to the fact that the drones were either not fully developed, or impotent from some cause. Like Mr. Daviett, he had no trouble in getting the drones accustomed to their narrow quarters.

Mr. Daviett, as will be noted, accustoms the worker-bees to flying out in the open air. This compelled them to become familiar with the outer entrances. Then when they were flying thickest, about 11 o'clock on up to 2, he opened the inner entrance, and allowed the drones and queen to intermingle in the enclosure. But the queens were not allowed to enter until the drones, as I understand it, had become content and flew around inside without bumping their heads against the netting, and that, when they were thus content, they would meet the queens half way. Mr. Daviett does not tell how his drones were brought to the proper sexual condition; but perhaps from the fact that they were allowed to go and come from their hives at will, to feed in the hive, and thus reach the condition of maturity and potency, he was able to succeed where the professor failed.

Mr. Hutchinson, in commenting on this matter of fertilizing queens in confinement, makes this very sensible remark: "Do not let us lose our heads with enthusiasm, nor toss the matter aside with contempt and ridicule"—a remark that I most heartily indorse. It has happened before that a plan or process which was abandoned after repeated trials has, years afterward, been resurrected and shown to be a perfect success. For instance, the attempt to harden india-rubber was continued till success was despaired of. By mere chance, however, as it would seem, some rubber was melted in a kettle that had some sulphur in it, and, lo! the secret was laid bare. Many such instances might be adduced.

While Mr. Hutchinson and I were discussing the merits of the plan of fertilizing queens in confinement, he said he hoped The A. I. Root Co. would think enough of it to give it a trial. I can only say this: We will talk it over among ourselves; and if the other members of our company feel that there is any hope of success we will put up such a tent.

It hardly needs to be said that the greatest bar to the breeding of long-tongued bees, hitherto, has been in the fact that we have been unable to control the fertilization of select stock. If fertilization of queens can be controled, great possibilities are before us.

To-day, March 12, I am home again in Medina, and will answer the great pile of letters awaiting me, as speedily as possible. I shall have some wonderful things to tell you in our next, in the line of high-pressure gardening; and to be ready to take advantage of it this season you had better sow at once some seed of self-blanching celery, or make sure in some way you can have some good nice plants ready as soon as the weather will permit of setting them out. I will tell you "what to do" and how to do it, later.—A. I. R.

And they come to Jesus, and see him that was possessed with the devil, and had the legion, sitting, and clothed, and in his right mind; and they were afraid. —MARK 5: 15.

In closing my talk Sunday evening at Wewahitchka I said something like this:

"Dear friends, inasmuch as you are all entire strangers to me I may be able to say some things to you that your respective pastors would hesitate to say, even if they entirely agree with me. For instance, I can speak very plainly in regard to the use of cigarettes, for I do not know whether this boy or that one uses them or not; but your pastor probably knows all about it. You might think him personal, and be offended; but you will not be offended with me, I am sure."

Then I pleaded with the young boys who have not commenced it, and told them what a very simple thing it is to let them alone, compared with breaking off after the habit is once formed. I had heard of a boy in that very locality, who absolutely could *not* break off, and the doctors told his friends if they wanted to save his life he must be watched *day and night;* and this very thing they are now doing if I understood correctly. I then asked how many in the audience had passed through the experience of breaking away from an evil habit.

The next day I had a talk on this matter with Mr. H. B. Buder, of Ilio Landing. Mr. B is now postmaster, boat agent, merchant, farmer, bee-keeper, and a very good man as every one in that locality will admit. I had heard, however, that he had not always been thus, and that he had passed through a remarkable experience. He finally himself told me that, for a great part of his life, he had not only used tobacco, but drank also. His regular business is watchmaker and jeweler; in fact, he became an expert, and earned enough money to have been well off, but it all went for the things I have mentioned, and evil companions. First his nerves began to give way. He could not adjust a hairspring, and perform other delicate work about a watch. He had always been an expert in all athletic games; but even his wonderful constitution could not stand it. He studied the matter over, and, like a sensible being, said, "Get thee behind me, Satan." He broke away from every thing, and accepted Christ as his Savior, and united with the church.

Now, here is the point of my story. When I asked him how big a job it was to break right square off from stimulants he said something like this:

"Mr. Root, you may be surprised to hear it, and my experience may be very unusual; but it *wasn't any task at all.* I have never wanted either drink or tobacco one minute since I quit. Getting off the load of a guilty conscience, which I had carried for years, was such a relief that I never *thought* of going back. I wouldn't touch either of them again for all of the money in the world. I have met my old comrades at our annual conventions (for I still attend some of them), but it wasn't a bit hard for me to say, 'No, gentlemen, I don't drink or smoke.' If they say, 'Why, do you mean to say you have turned pious?' I reply, 'That is just what I have done; and if you will come along with me, and do the same, you will declare right away it is the most sensible thing any one can do.'"

The above is not exactly his own words, but the substance of them. When I asked if I might publish what he had told me, he replied:

"To be sure, you may, Mr. Root. I am ready to stand up before all the world as a humble follower of the Lord Jesus Christ; and there is nothing I enjoy more than using my influence for him as far as it will go."

As a matter of course, soon after our friend started out in the new life he married a good woman, and they two now make a very pleasant home for travelers stopping over night or waiting for boats.

The reason why, or at least one great reason why, friend B. has had no awful battle with his old bad habits is that he made a full and complete surrender. He never *looked back* after he had turned heavenward; nay, let us put it still stronger—he never *thought* of looking back; then the "old man," with his legion of evil ways, was *gone*, and in his stead was the new creature "sitting and clothed, and in his right mind." No wonder they were afraid.

Special Notices by A. I. Root.

WHITE DUTCH CLOVER SEED—ADVANCE IN PRICE.

The best present figures are: Bushel, $10.00; ½ bushel, $5 25; peck, $2.75; 1 lb., 20 cts.; 1 lb. by mail, 30 cts.

PRICE OF THE NEW POTATO-PLANTER.

By an oversight no price was given in our Feb. 15th issue of the potato-planter described and illustrated. It is only 75 cts.; and as it weighs only 2½ lbs it *can* be sent by mail for only 45 cts.; but it had better be sent by express, or, better still, by freight with other goods.

SWEET CLOVER SEED—ANOTHER ADVANCE IN PRICE.

The best price we can possibly make at the present date is, 100 lbs., 10 cts per lb.; 10 lbs. or more, 12 cts. per lb.; single pound, 15 cts.; single pound by mail, 25 cts. The above is for seeds with the hulls on Seed with hulls off will be 5 cts. per lb. more than the above prices.

THE NEW CAULIFLOWER SEED—THE MATTITUCK ERFURT.

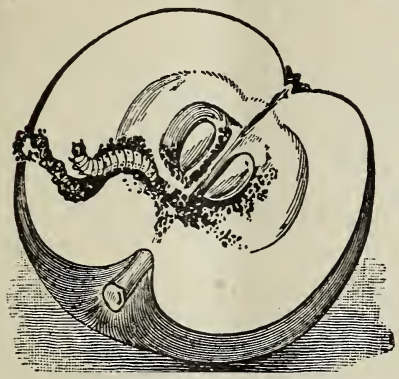
After the notice given in our Jan. 15th issue concerning this new cauliflower, a tremendous demand sprang up. For a time we were out of seed, and unable to fill orders; but by considerable persuasion we secured the last bit of seed friend March had left, and can still supply it in 5-cent packets, or ⅛-ounce packets at 25 cts.; ¼-ounce, 40 cts.

GLASS ADVANCED AGAIN.

We are again obliged to mark up the price of 8x10 glass for greenhouse sash to $3.60 per box of 90 lights or 50 sq. feet, and a like advance will apply to all special sizes or strips which we can not obtain cut from waste. Strips over 16 inches long to 20 inches are worth $1.20 per box by the latest prices received.

SPRAYING FRUIT-TREES.

The question of spraying fruit-trees to prevent the depredations of insect pests and fungus diseases is no longer an experiment but a necessity.



Our readers will do well to write Wm. Stahl, Quincy, Ill., and get his catalog describing twenty-one styles of Spraying Outfits and full treatise on spraying the different fruit and vegetable crops, which contains much valuable information, and may be had for the asking.

$50.00 POP CORN.

100 seeds of this wonderful new Pop Corn for **25c** and chance to compete for our cash prizes. Seed Due Bill good for **25c** worth of other goods **FREE** with every order for Pop Corn. First-prize winner last year raised at the rate of 188 bushels per acre. We will pay **$50** for its equal in quality. Handsome seed catalog and free presents with every offer.

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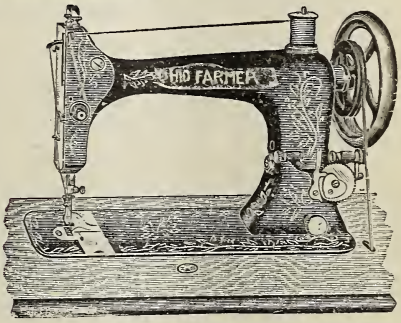

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THE A. I. ROOT COMPANY.

CELERY-GROWING BY SUB-IRRIGATION, NEAR SANFORD, FLA.

One of the principal reasons for my recent trip was to look up and write up the new industry of celery and lettuce growing in different parts of Florida. That State is a land of wonderful contrasts. Perhaps not one acre in a thousand there is made any use of at all. While stopping with a friend, he made a remark to the effect that he had, the day before, closed a deal for 1000 acres of land. I stopped in surprise, and, looking at him, said:

"Do you mean that *you* have actually purchased a thousand acres of land?"

"That is what I said, and I was thinking of going out to look it over, or a part of it, for I have not yet seen it myself."

"Do you mind telling me about how much an acre it cost you?"

"Well, probably the greater part of it cost 50 cts. an acre — some of it considerably more than that."

So you see it did not take very much money after all to become the owner of a thousand acres. I was still more astonished when I saw land right adjoining the new purchase that had had fine crops of sugar cane, corn, and other Florida crops. It was dark sandy loam, beautiful to work, and it seemed to me it ought to be worth $40 or $50 an acre almost anywhere. Well, right in this very region were orange-groves which, before the frost, could not have been bought for $1000 an acre, and there is no reason in the world why this same land, that was sold at 50 cts. an acre might not soon be worth $1000 an acre providing the seasons in the future should finally settle down something as they were before the great freeze six years ago. Well, right where the great yields of celery were made I am going to tell you about, and are being made, there are *hundreds* of deserted plantations. Beautiful homes, or what were such but a few years ago, yes, almost *princely* residences, are now going to ruin. The owners became discouraged because of the freezes, and moved away. For miles and miles in any direction you can see only desolation and ruin. Now for the other side.

Six years ago I told you about the artesian wells of Florida. All around Sanford, for miles in almost any direction, one can get artesian water by going down from 50 to 150 feet. I saw four-inch pipes six years ago pouring out a full stream.

Well, these pipes have been running during all the last six years, and I found them running just the same on my last visit. Nobody even takes the pains to turn the valve and shut off the water. When I spoke about the supply being exhausted they stared at me in astonishment.

One of our first visits was to C. F. Williams, of Sanford. Mr. W. commenced last summer by clearing off two acres of palmetto or hammock land. There were so many palmetto stumps, and they were so large, he could not well burn them, so he bought some of the cheap land adjoining his own, and tumbled the rubbish over on to it. I spoke about burying the great stumps, as we do boulders here in the North; but he said when land cost only from $2.50 to $5.00 an acre it was cheaper to dump the rubbish on a piece of land bought for the purpose than to waste time and money in trying to bury it. The two acres were all cleared off by hand work, or "grubbed out," as they call it. This may have cost about $50 an acre. Then open ditches were made all around the outside, and at right angles through the middle. In fact, these open ditches were only two or three rods apart, if I remember correctly, and they were in depth something like 15 or 18 inches. An outlet was secured so that the whole plantation could be thoroughly drained so the ditches would be dry enough to walk in. Of course, all ditches must slope a little toward the outlet, and the sides must be sloping enough (bottom flat), so when soaking wet they don't cave in. Now, with their black porous sandy loam, we might think this was underdrainage enough. Not so, however. Either tiles or wooden boxes were put through these beds between the open ditches, say every 10 or 12 feet. Some people use tiles, and others use V-shaped troughs, with the apex uppermost; and these tiles or wooden boxes were a little above the bottom of the open ditches. The idea is, to be able to let off every bit of water whenever the soil shall become water-soaked by tremendous rains or by artificial flooding, as I shall explain. These tiles and wooden boxes also serve to let air come in through the roots of the celery-plants.

Now, at some point in the garden—perhaps right in the center—a four-inch iron pipe is driven down until it will run out full of water. I think a four-inch stream will irrigate two acres easily. Thus, you see, whenever there is a lack of rain, or the light soil becomes too dry, the valve of the four-inch pipe is opened, the outlet to the open ditches closed up, and the whole plantation allowed to fill up with water until it rises by capillary attraction so the celery-plants are sufficiently watered. The common way of bleaching is with boards. Some growers plant the celery in a single row, say 2½ feet apart. Others have a double row, the plants standing only about 6 inches from each other. At the proper stage of growth one-foot cypress boards are put up at each side in the usual way. Now, Mr. Williams has got on to "the new celery culture." Instead of one row or two rows he plants *seven rows* of celery side by side, so the plants are only six inches apart from center to center. Then boards are put each side of these seven rows. The plants are then made to grow with such rank luxuriance that they bleach each other. Considerable quantities of stable manure are used first. I was not able to determine just how much. The plants are coaxed, not only by water, alternating with perfect drainage, but by constant

stirring of the soil; and, furthermore, the most stimulating fertilizers are applied at every stage of the growth until the plants fill the entire space so that no implement can get between them. Then they are pushed by water and drainage.

The fertilizer most used at this garden was bought of Wilson & Toomer, Jacksonville, Fla. They call it Peruvian vegetable manure. Mr. Williams said it was the next thing to Peruvian guano. The cost of fertilizers for an acre of celery, or at least the cost to him, as he figured it, was $150, perhaps more. Lots of work, and lots of money, you say. Yes, my friends, there is no high-pressure gardening without money and work. Now for the result.

I saw one of these beds containing 350 sq. feet where the crop had just been harvested, and shipped to New York. I suppose the owner of the garden was as much surprised as anybody to receive a check for $39.00. This amount was above the freight, mind you, for the celery grown on 350 square feet. He said one of his friends figured up that the yield was at the rate of $5000 per acre. He had been too busy to do the figuring—in fact, did not care particularly about it. Now, the question that has come up thousands of times before faced me once more. I looked at this energetic young gardener and said, "Mr. Williams, is it possible for you to manage a whole acre (of course hiring all the help you need) so as to make a result something like this little bed which you have here, of less than two square rods?"

He smiled as he replied, "Mr. Root, that is the question I am asking myself. Just come this way and see what I am doing along that line."

To my great joy and surprise he showed me a bed, 7 rows wide, perhaps 12 rods long, nearly ready to be banked up, with every plant a model one, and just like its neighbor. Next to this bed was one with plants a little smaller, then another with plants smaller still, and so on down, step by step. He had evidently tried to put not only just the same amount of fertilizer but the same amount of *brains* on every square foot that he did with his first experiment. The astonishing thing about it was there were no poor spots or small or indifferent plants, and I found by questioning that he had sorted his plants, and graded them, before putting them out. All of one size were put in a certain bed; then if a plant, or a dozen or two of them, got to lagging behind he took them up and put better ones in their places, thus *insisting* on a perfect, even stand.

Now, then, why in the world do not the poor people in Florida, and everywhere else, get a little bit of ground, say half an acre, and go to work and do what I have been describing? I was tempted to say it is because they actually *can* not do it, but I think I had better say it is because they *will* not. As I write I am looking out on a piece of low rich ground that is generally too wet, and I have been wondering whether even I myself have the grit and determination to do what I saw that young man do down there in Florida. You see, human nature has such a constant tendency to backslide, and go down hill, there is only one in a thousand or one in ten thousand who will be up and on the alert to *push* things in the way I have described.

Now, this wonderful revelation—and that is just what it was to me—does not apply to celery alone. Wonderful crops of lettuce are grown in just the same way, or in much the same way, and I do not know but it brings almost as much money; and thousands of other crops can be grown, getting more from an acre than ordinarily grows on ten acres—yes, getting as much from a single acre on high-pressure gardening as thousands of farmers get from *a hundred acres*.

Florida has the advantage of us in having this artesian water, without stint or limit. Then there are no frosts, that I know of, that interfere with celery. The crop needs no covering. I forgot to say the variety grown is the Golden Self-blanching, known now all over the world.

Now, I hope you will all go to work and make a trial of at least a few rods by subirrigation. You can certainly get enough water to fill up the open ditches when it does not rain enough; and when you get something extra nice, may be I will get around to look it over.

The question naturally comes up, "Why these open ditches instead of good-sized tiles?" Well, as nearly as I can understand it the open ditches are to enable you to see when the plants have water enough, and to be sure they do not get too much. I am under the impression they give better drainage and better aeration than any other plan. In our most expensive greenhouses I notice they are placing tiles under all the beds only three or four feet apart, letting them reach over into the paths, so that in case anybody does overwater any sort of stuff, the water immediately runs away and thus we avoid danger from standing water.

The plan I have given above succeeds. I should be afraid to try some other way until I knew by experiment that it is just as good as the one I have given. The great secret is *feeding* the plants from the very beginning to the end. Old well-rotted stable manure has always been our cheapest and most effective fertilizer. But please remember that, if you are going to get a crop worth $25 or more to the square rod, you must hunt up the very best and most concentrated fertilizer that can possibly be found, suitable for the particular crop in your own locality, and apply it without stint.

Mr. H. H. Chappell has also about two acres adjoining the above, almost if not quite as good as I have described. He was not at home at the time, but his good wife showed us around, and answered our many questions.

There are similar enterprises scattered off for miles in every direction. Not many of them, however, are up to such a standard of excellence as the one I have just described. In fact, I am sorry to say some are only making sad failures.

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